- **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn - **Our Code** - We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. - **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn **- Our Code -** We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. - **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. **- Our Watchword -** Watch and Warn - **Our Code** - We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. - **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn - **Our Code** - We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. - **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn - **Our Code** - We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. - **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn - **Our Code** - We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. **- Our Motto -** Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn - **Our Code** - We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. - **Our Motto** - Keep our Forests Green **- Our Pledge -** As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn - **Our Code** - We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. - **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the

Junior Forest Wardens

Green Tree - Trailblazer Warden Manual

This Book Belongs to:

The Purpose

The Junior Forest Warden Program is a challenging and rewarding outdoor-oriented experience designed to develop an awareness, appreciation and respect for, and responsible use of our natural environment.

The Pledge

"As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage."

The Code

"We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right."

The Traditional Version

"God has given us the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right."

The Watchword

“Keep our Forests Green”

The Motto

“Watch and Warn”

Junior Forest Wardens

Green Tree

Trailblazer

Warden Manual

Alberta Junior Forest Warden Association

Junior Forest Wardens
Green Tree Trailblazer Warden Manual
Jean Funk

Editor
Heather A. Markham

Contributing Writers
Bill Bresnahan
Heather A. Markham
Mors Kochanski

Design and Graphics
Heather A. Markham

People Illustrations
Brad Burns

Printed and bound in Canada
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Second Edition 1991, Second Printing 1993

ALBERTA JUNIOR FOREST WARDEN ASSOCIATION

Thank you

We wish to thank the following Junior Forest Warden friends for their contributions to this manual.

Charlie Wilkinson, for recognizing that our youth play an important part in looking after our natural resources.

Bill Myring, for the vision of a National Junior Forest Warden program.

Jean Funk, for re-designing the Junior Forest Warden program to meet the needs of today's youth and their leaders.

Mors Kochanski, for much of the material in the Woodstravel section of this manual.

Joy and Cam Finlay, for the illustrations and material on animal tracking in the Ecology section of this manual.

And the many volunteers who have contributed their ideas and time to the Junior Forest Warden manuals over the years.

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And a special thank you to Bill Bresnahan, Chief Warden of Alberta (1993).

Junior Forest Wardens Green Tree Trailblazer Warden Manual

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Heather A. Markham (1986)
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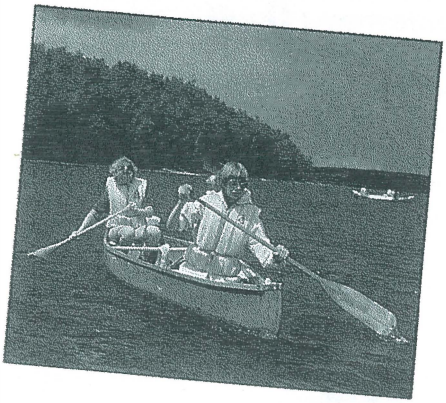
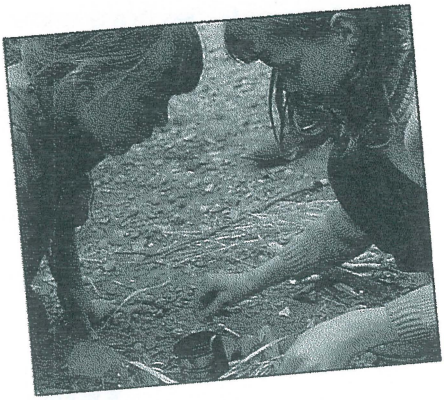
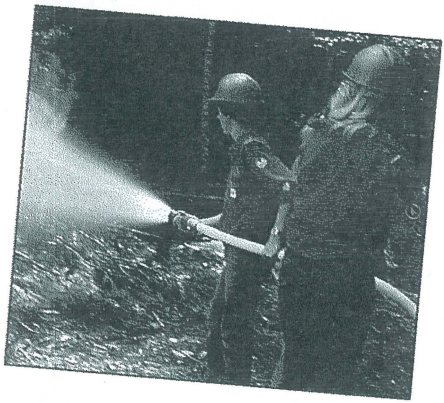
Welcome to Junior Forest Wardens!







Congratulations, you have joined the Junior Forest Warden adventure program! Junior Forest Wardens is a program for young people to "learn by doing" Forestry, Woodstravel, Ecology and Leadership activities.

You will learn why trees grow, how to plant them, how to prevent forest fires, how to make a cooking fire, an outdoor shelter, why bugs are fun to watch and how to teach others what you have learned.

You may have the choice to earn badges. However, there is one badge that all Junior Forest Wardens work on and that is the Bronze Badge. The Bronze Badge program teaches the history of Junior Forest Wardens, the Code, Motto and Watchword, the badges you can earn and how to wear your uniform.

This manual has activities that you can do at home or with your club. Some of the activities have a key beside them (). This key tells you the activity is one that you should do with your leader or with adult supervision. The key activities are all ones in which extra care must be taken for your personal safety.

You can use the Warden Record cards at the back of this manual to record completed activities when you are working on badges.

Welcome to the Junior Forest Warden Adventure Family!

What's Inside

Activities

Notes

Bronze Badge

Did you know that healthy forests are responsible for the air that you breathe and the water that you drink? Forests help prevent floods and erosion by holding rain and snow in the soil. The forest is home to many creatures, from the tiny shrew to the huge grizzly bear. Both your life and theirs depends on the forest.

As a Junior Forest Warden, you will learn how to take an active, responsible role in conserving our natural resources.This means using them wisely now and planning for their future use. You will learn about nature through hands-on projects and activities, and by living in the out-of-doors.

You will also learn:

- The History of Junior Forest Wardens
- Our Motto
- Our Watchword
- The Junior Forest Warden Code
- Our Pledge
- The Junior Forest Warden Program and Badges
- About the JFW Uniform

Once you have learned these, you will receive the Bronze Badge. You will then be a Junior Forest Warden.

Good luck on your journey!

The History of Junior Forest Wardens

In the spring of 1930, Charlie Wilkinson started the Junior Forest Warden Organization. Charlie, who was with the Canadian Forestry Association, decided that children could teach their classmates, families and friends about the dangers of wildfires to forests in B.C. In 1930, Junior Forest Wardens planted a Douglas-fir in Stanley Park, Vancouver, British Columbia in soil collected by wardens from every part of British Columbia. The next time you visit Vancouver plan to visit "our" tree! It is a healthy, growing symbol of the Junior Forest Warden Program.

Only boys were Junior Forest Wardens in the 1930s, however in 1944, more than 500 girls became charter members of the Girl Forest Guards. Today, any child may belong to JFWs.

Motto

"Keep Our Forests Green"

WatchWord

"Watch and Warn"

Could you be a "walking, talking" poster who tells your school friends to do their best to keep forests green? That's what the first Junior Forest Wardens were. Every May, the school superintendent appointed wardens to be walking, talking posters until October, which is the length of the forest fire season. They showed both students and adults how to watch for forest fires and told them who to tell if they spotted a fire.

In 1991, Junior Forest Wardens in Alberta planted a Blue Spruce Tree in Hinton. The tree was planted in soil collected from JFW clubs throughout Alberta to honour 30 years of JFW in Alberta!

The Pledge tells us how to live the JFW Code everyday. When we say the Pledge, we agree to appreciate and to responsibly use our natural environment and it's resources.

The Pledge

"As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife and natural heritages."

The Traditional Code:
"God has given us the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right."

The Code

"We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right."

John Ruskin wrote these words. He loved to travel in the rugged mountains of Switzerland. They excited him more than any other natural area. Later he heard that the clear lakes and clean air had become polluted. He wrote and told people that they had to learn to wisely use natural resources. He said that they should care about all of our planet. John Ruskin wrote about Ecology and Conservation 100 years ago.

In your own words write what the code means to you . . .

Junior Forest Warden Program and Badges

Junior Forest Wardens help to plan their club program. First, all wardens earn the Bronze Badge. Then, each club chooses to do the Tree Challenge Program or to earn Maple Leaf Badges. Your club may also decide to do a little of each program.

Tree Challenge Program

There are four kinds of Junior Forest Warden challenges. They are Forestry, Woodstravel, Ecology and Leadership.
Once you have completed the four challenges, you can receive the Green Tree Badge. Review the record cards at the back of this manual to find out the activities you need to complete, to receive each badge and to earn the Green Tree Badge.

Forestry

Woodstravel

Ecology

Leadership

Maple Leaf Badge

You will receive a Maple Leaf Badge after you have completed one year of JFW activities which should include participation in Forestry, Woodstravel, Ecology and Leadership.

Identification Badges

These badges show what club you belong to. You can wear three types of identification badges on your uniform.

- **a provincial badge**
- **a club identification badge**
- **a Trailblazer Green Tree I.D. badge**

Wear the provincial badge on the uniform pocket. Wear the club and program badges on the left sleeve.

Special Badges

There are three special badges. You can earn each badge only once in your life as a Junior Forest Warden. They are presented for extra special work for JFWs.

Fire Honour

Silver Honour

Gold Honour

Fire Honour

This badge is awarded for giving service on the fireline, reporting a bush or forest fire, or for significant contribution to fire suppression.

Gold and Silver Honour Awards

Silver and Gold awards are presented for significant contribution, dedication, service and valour,.to their club and organization in leadership and participation. Wardens receive a badge and a lapel pin. To recommend a warden for the Silver and Gold Honour, the warden's contributions are outlined in a letter written by adult leaders and council members to the regional JFW office.

Badges From Other Associations

You can wear the highest badge you have earned from:

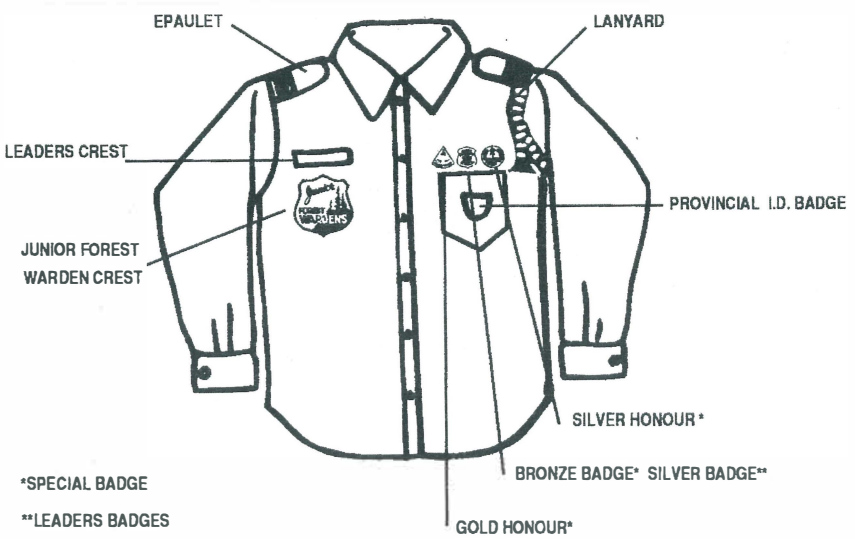
- **Red Cross**
- **St. John Ambulance**
- **Royal Life Saving Society**
- **Duke of Edinburgh Award**
- **Alberta Conservation Hunter Education**

Wear the badge on the bottom half of the left sleeve of your uniform.

The Uniform

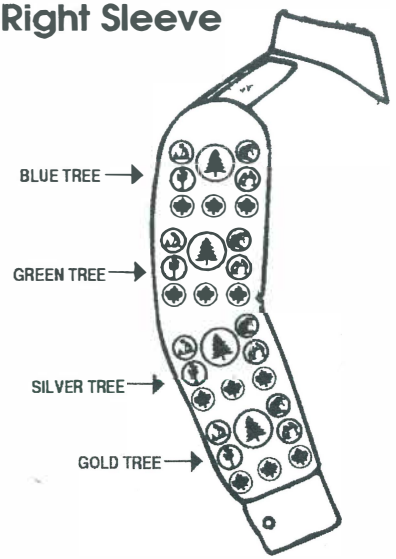
The Junior Forest Warden red shirt and jeans or slacks are the official uniform. Keep your uniform neat and clean. The program badges (including the Maple Leaf Badges) are worn on the left sleeve. The illustration shows how a Warden who has completed three years and earned the Tree Challenge Badges, would wear their badges.

The **JFW Crest, Bronze Badge, Provincial Identifiction Badge, Silver Honour**, and **Gold Honour** are worn on the front of the shirt.

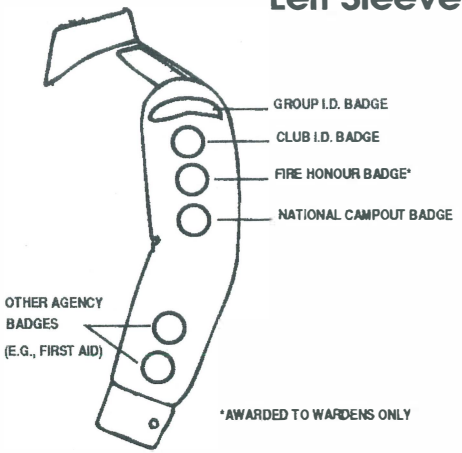


Program Badges are worn on the right sleeve and **Special Badges** are worn on the left sleeve.

Right Sleeve



Left Sleeve



Forestry

Forest are homes for towering trees, delicate meadow flowers, grazing mammals and colourful butterflies. Forests are places where people play, work and live. They are also places where Junior Forest Wardens learn how to responsibly enjoy the forests, wildlife and our natural heritage.

In the Green Tree Trailblazer program, you will learn how to care for timber, wildlife and fisheries, ranges and water and recreation resources. Some of the activities you will learn are:

- How to grow a tree from seed
- How to plant trees
- Improve wildlife habitat
- How to conserve water on campouts
- How rangelands are used
- How to identify forest insects
- Make a tree disease collection
- Tour a fire tower
- Participate in a community service project

We will start our adventure in learning more about our forests with the following story by Jean Giono about a man who planted trees, and changed a town.

The Man Who Planted Hope

A true story by Jean Giono

About forty years ago I was taking a long trip on foot over mountain heights quite unknown to tourists. At the time I embarked upon my long walk through these deserted regions, the land was barren and colorless. Nothing grew there but wild lavender.

I was crossing the area at its wildest point, and after three days' walking found myself in the midst of desolation. I camped near an abandoned village. I had run out of water the day before, and had to find some. These clustered houses, although in ruins, suggested that there must have been a spring or well here once. There was, indeed, a spring, but it was dry. The five or six houses, roofless, gnawed by wind and rain, the tiny chapel with its crumbling steeple, stood about like the houses and chapels in living villages, but all life had vanished.

It was a fine June day, brilliant with sunlight, but over this unsheltered land, high in the sky, the wind blew with unendurable ferocity. It growled over the carcasses of the houses like a lion disturbed at his meal. I had to move my camp.

After five hours of walking I had still not found water, and there was nothing to give me any hope of finding any. All about me was the same dryness, the same coarse grasses. I thought I glimpsed in the distance a small black silhouette, upright, and took it for the trunk of a solitary tree. In any case I started towards it. It was a shepherd. Thirty sheep were lying about him on the baking earth.

He gave me a drink from his water gourd and, a little later, took me to his cottage in a fold of the plain. He drew his water–excellent water–from a very deep natural well above which he had constructed a primitive winch.

The man spoke little. This is the way of those who live alone, but I felt that he was sure of himself, and confident. That was unexpected

in this barren country. He lived, not in a cabin, but in a real house built of stone. His roof was strong and sound. The wind on its tiles made the sound of the sea upon its shores.

The place was in order, the dishes washed, the floor swept, his rifle oiled; his soup was boiling over the fire. I noticed then that he was cleanly shaved, that all his buttons were firmly sewed on, that his clothing had been mended with the meticulous care that makes the mending invisible. He shared his soup with me and afterwards, when I offered my tobacco pouch, he told me that he did not smoke. His dog, as silent as himself, was friendly without being servile.

It was understood from the first that I should spend the night there; the nearest village was still more than a day and a half away. And besides, I was perfectly familiar with the nature of the rare villages in that region. There were four or five of them scattered well apart from each other on these mountain slopes, among white oak thickets, at the extreme end of the wagon roads. They were inhabited by charcoal burners, and the living was bad. Families, crowded together in a climate that is excessively harsh both in winter and in summer, found no escape from the unceasing conflict of personalities. There was rivalry in everything, over the price of charcoal and over a pew in the church. And over all there was the wind, also ceaseless, to rasp upon the nerves. There were epidemics of suicide and frequent cases of insanity, usually homicidal.

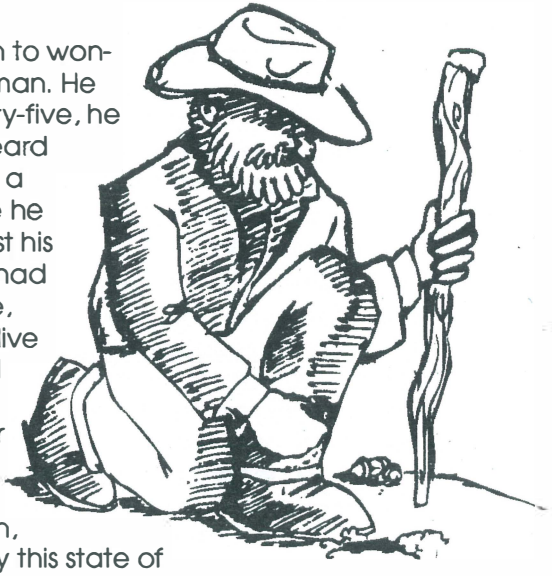
The shepherd went to fetch a small sack and poured out a heap of acorns on the table. He began to inspect them one by one, with great concentration, separating the good from the bad. I smoked my pipe. I did not offer to help him. He told me it was his job. And in fact, seeing the care he devoted to the task, I did not insist on helping. That was the whole of our conversation. When he had set aside a large enough pile of good acorns he counted them by tens, meanwhile eliminating the small ones or those which were slightly cracked. When he had selected one hundred perfect acorns, he stopped and he went to bed.

There was peace in being with this man. The next day I asked if I might rest there for a day. He found it quite natural–or to be more exact, he gave me the impression that nothing could startle him. The rest was not absolutely necessary, but I was interested and wished to know more about him. He opened the pen and led his flocks to pasture. Before leaving, he plunged his sack of carefully selected and counted acorns into a pail of water.

I noticed that he carried an iron rod for a stick. Resting myself by walking, I followed a path parallel to his. His pasture was in a valley. He left the little flock in charge of the dog and climbed towards where I stood. I was afraid that he would rebuke me for my indiscre-

tion, but it was not that at all; this was the way he was going, and he invited me to go along if I had nothing better to do. He climbed to the top of the ridge about a hundred yards away.

There he began pushing the iron rod into the earth, making a hole in which he planted an acorn; then he refilled the hole. he was planting an oak tree. I asked him if the land belonged to him. he answered no. Did he know whose it was? he did not. He supposed it was community property, or perhaps belonged to people who cared nothing about it. He planted his hundred acorns with the greatest care. After the midday meal he resumed his planting. I suppose I must have been fairly insistent in my questioning, for he answered me. For three years he had been planting trees in this wilderness. he had planted 100,000. Of these, 20,000 had sprouted. Of the 20,000, he still expected to lose about half to rodents or to the unpredictable. There remained 10,000 oak trees to grow where nothing had grown before.



That was when I began to wonder about the age of this man. He was obviously over fifty. Fifty-five, he told me. His name was Elzeard Bouffier. He had once had a farm in the lowlands. There he had had his life. He had lost his only son, then his wife. He had withdrawn into this solitude, where his pleasure was to live leisurely with his lambs and his dog. It was his opinion that this land was dying for want of trees. He added that, having no very pressing business of his own, he had resolved to remedy this state of affairs.

I told him that in thirty years his 10,000 oaks would be magnificent. He answered quite simply that if God granted him life, in thirty years he would have planted so many more that these 10,000 would be like a drop in the ocean.

Besides, he was now studying the reproduction of beech trees and had a nursery of seedlings grown from beechnuts near his cottage. The seedlings, which he protected from his sheep with a wire fence, were very beautiful. He was also considering birches for the valleys where, he told me, there was a certain amount of moisture a few yards below the surface of the soil.

The next day we parted.

The following year came the War of 1914, in which I was involved for the next five years. An infantryman hardly had time for reflecting on trees. To tell the truth, I had considered it as a hobby, a stamp collection, and forgotten it.

The war over, I had a huge desire to breathe fresh air for a while. The countryside had not changed. I began to think again of the shepherd tree planter. "Ten thousand oaks," I reflected, "really take up quite a bit of space." I found Elzeard Bouffier. He had changed jobs. Now he had only four sheep but, instead, a hundred beehives. He had got rid of the sheep because they threatened his young trees. For, he told me, the war had not disturbed him at all. He had continued to plant.

The oaks of 1910 were then ten years old and taller than either of us. It was an impressive spectacle. I was literally speechless and, as he did not talk, we spent the whole day walking in silence through his forest. In three section, it measured eleven kilometers in length and three kilometers at its greatest width. When you remembered that all this had sprung from the hands and the soul of this one man, without technical resources, you understand that men could be as effectual as God in realms other than that of destruction.

He had pursued his plan, and beech trees as high as my shoulder, spreading out as far as the eye could reach, confirmed it. He showed me handsome clumps of birch planted five years before–that is, in 1915 when I had been fighting in Verdun France. He had set them out in all the valleys where he had guessed–and rightly–that there was moisture almost at the surface of the ground.

Creation seemed to come about in a sort of chain reaction. As we went back towards the village, I saw water flowing in brooks that had been dry since the memory of man. This was the most impressive result of chain reaction that I had seen. The wind too, scattered seeds. As the water reappeared, so there reappeared willows, rushes, meadows, gardens, flowers, and a certain purpose in being alive. But the transformation took place so gradually that it became part of the pattern without causing any astonishment.

In 1933, he received a visit from a forest ranger who notified him of an order against lighting fires out of doors for fear of endangering the growth of this "natural" forest. It was the first time the man told Bouffier, that he had ever heard of a forest growing of its own accord. At that time Bouffier was about to plant beeches at a spot some twelve kilometers from his cottage. In order to avoid travelling back and forth–for he was then seventy-five–he planned to build a stone cabin right at the plantation. The next year he did so.

In 1935, a whole delegation came from the government to examine the "natural forest". The whole forest was placed under the protection of the State, and charcoal burning was prohibited. A friend of mine was among the the forestry officers of the delegation. I explained the mystery to him. One day the following week we went together to see Elzeard Bouffier. We found him hard at work, some ten kilometers from the spot where the inspection had taken place.

This forester was not my friend for nothing. He was aware of values. He knew how to keep silent. I delivered the eggs I had brought as a present. We shared our lunch among the three of us and spent several hours in wordless contemplation of the countryside.

It was thanks to this officer that not only the forest but also the happiness of the man was protected. He delegated three rangers to watch over the forest.

I saw Elzeard Bouffier for the last time in June of 1945. He was then eighty-seven. Everything was changed. Even the air. Instead of the harsh dry winds that used to attack me, a gentle breeze was blowing, laden with scents. A sound like water came from the mountains; it was the wind in the forest; most amazing of all, I heard the actual sound of water falling into a pool. I saw that a fountain had been built, that it flowed freely and–what touched me the most–that someone had planted a linden tree beside it, a linden that must have been four years old, already in full leaf, the incontestable symbol of resurrection.

On the site of the ruins I had seen in 1913 now stand neat farms, cleanly plastered, testifying to a happy and comfortable life. The old streams, fed by the rains and snows that the forest conserves, are flowing again. Their waters have been channeled. On each farm, on groves of maples, fountainpools overflow onto carpets of fresh mint.

Little by little the villages have been rebuilt. People from the plains, where land is costly, have settled here, bringing youth, motion, the spirit of adventure. Counting the former population, more than 10,000 people owe their happiness to Elzeard Bouffier.

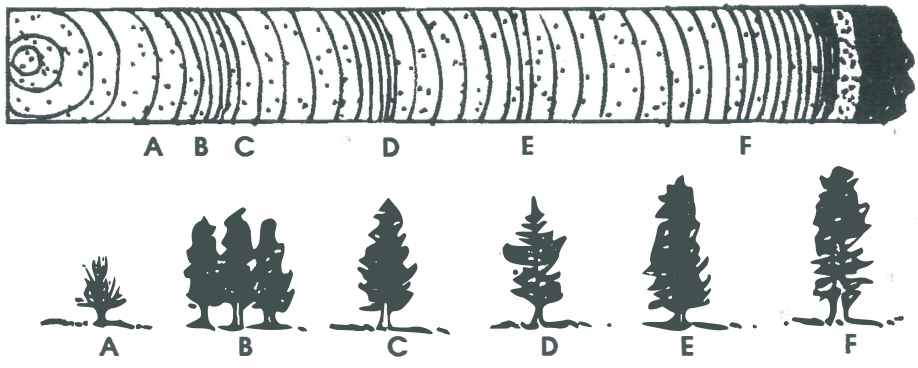
When I reflect that one man, armed only with his own physical and moral resources, was able to bring this land to spring from waste-land, I am convinced that, in spite of everything, humanity is admirable. But when I compute the unfailing greatness of spirit that it must have taken to achieve this result, I am taken with an immense respect for that old and unlearned peasant who was able to complete a work worthy of God.

Elzeard Bouffier died peacefully in 1947 at the hospice (hospital) in Banon.

How A Tree Grows

Life History of a Tree

Each annual ring contains the springwood and summerwood of one year in the life of a tree. A wide ring means that conditions for growth were good; a narrow ring shows slow growth. The cross-section shown below could be explained as follows:



A. The tree is young and growing rapidly, with enough sun, water and nutrients.

B. As the tree grows, so do its neighbours. As competition for sun, water and nutrients increases, growth decreases.

C. Some of the neighboring vegetation is cut, reducing competition. Growth then increases.

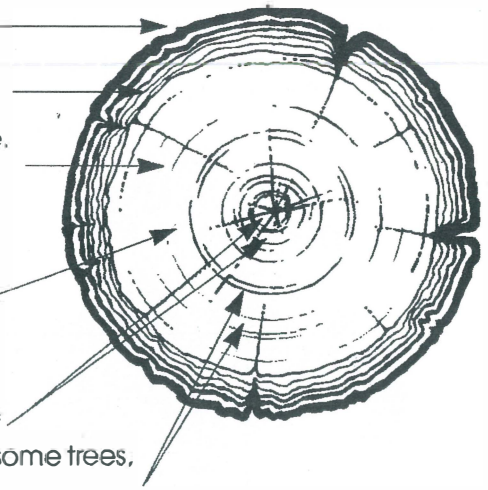
D. Growth has slowed drastically for a few years, perhaps because of an outbreak of disease or insects, such as spruce budworm. A tree without leaves cannot produce enough food for growth.

E. The tree has recovered, and growth has improved.

F. Growth is slowing as the tree weakens with age.

Anatomy of a Tree Cookie

Outer bark: The "skin," which protects the trunk.
Inner Bark: "phloem," which conducts food from the crown (top) down to the rest of the tree.
Cambium: contains the growing cells. The inner layer becomes wood, the outer layer becomes bark.
Sapwood: the outer portion of wood which carries water and minerals from the roots up to the crown.
Heartwood: the inactive center of the tree or the support column. In some trees, this is darker than the sapwood.

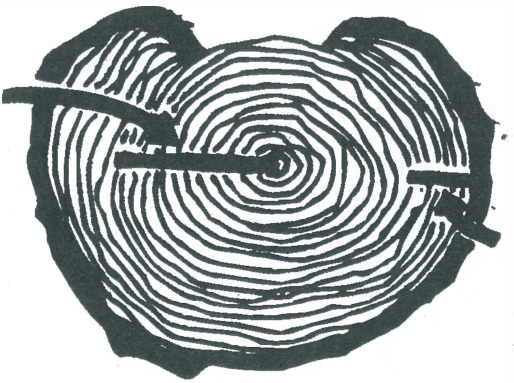


Annual Ring: made up of two types of wood. Springwood: large celled wood formed early in the growing season. Summerwood: dense, dark wood formed later in the growing season.

Fires, Insects and Diseases

Disease and insects can enter a tree through fire scars or other environmental damage.

Rapid growth 14 years before a fire.

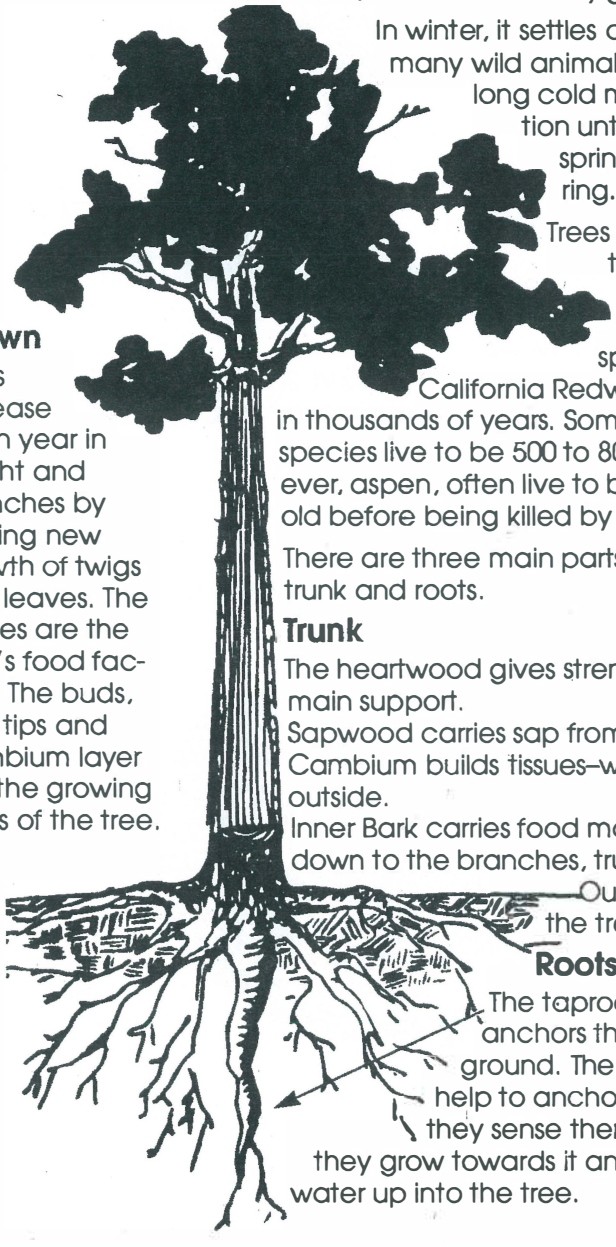


Retarded growth 13 years after a fire.

Parts of a Tree

In many ways the life history of a tree is much like that of a human being, full of mystery and interest.

To live and grow, the tree must have food, water, air and sunshine, as well as alternating periods of growth activity and rest. During the summer,the tree is actively growing.



In winter, it settles down, much like many wild animals, to spend the long cold months in hibernation until the warmth of spring sets the sap stirring.

Trees usually live longer than people. On the Pacific Coast, the life span of the California Redwood is measured in thousands of years. Some other western species live to be 500 to 800 years old. However, aspen, often live to be only 80 years old before being killed by disease.

There are three main parts of a tree: crown, trunk and roots.

Crown

Trees increase each year in height and branches by adding new growth of twigs and leaves. The leaves are the tree's food factory. The buds, root tips and cambium layer are the growing parts of the tree.

Trunk

The heartwood gives strength and is the main support.

Sapwood carries sap from roots to leaves.

Cambium builds tissues–wood inside, bark outside.

Inner Bark carries food made in the leaves down to the branches, trunk and roots.

Outer bark protects the tree from injuries.

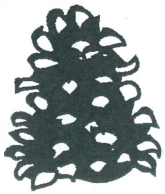
Roots

The taproot gets water and anchors the tree firmly in the ground. The lateral roots also help to anchor the tree. When they sense there is water nearby, they grow towards it and then pull the water up into the tree.

Seeds To Trees

Planting a tree from seed is simple but helping it to grow into a healthy seedling to plant in the forest, requires lots of care and patience. The best time of year to plant tree seeds is in January.

You Will Need



- seeds such as Colorado spruce (also known as blue spruce or silver spruce), lodgepole pine (you must heat these in an oven so they will open to release the seeds).
- peat moss
- empty cardboard milk containers or root trainers (available from greenhouses).

Preparation

Soak seeds in water for 24 hours. Wrap the soaked seeds in a wet paper towel and store them in the refrigerator for three weeks. Keep the paper towel moist. This procedure is called stratification and is similar to the method used in forestry greenhouses. Stratification mimics Mother Nature's way of encouraging seeds to germinate in the spring. The moisture helps to soften the seed coat and the cool temperatures are similar to spring outdoors. In nature, the melting spring snow provides the moisture young germinating seeds need.

- Pour some water in the peat moss until it feels evenly moist (a plastic garbage bag works well).
- Fill milk cartons ¾ full with the moist peat moss. Place one seed in each corner of a 2 litre carton or one seed in a 1 litre carton; cover with more soil, water and place in a pie tin. Poke a hole in the bottom of the carton for drainage. (If using root trainers, plant one seed per column.) Write the name of the seed on the carton, and the date it was planted.
- Place the carton in a sunny location and keep the soil moist. When the seedlings are about 2 cm tall, apply a damping-off solution according to the package directions (available from greenhouses).
- Continue to water your seedling and plant outdoors in spring to allow time for it to adapt to its environment before winter begins.

Planting a Seedling

Planting a seedling is as simple as 1-2-3. Plant a seedling, then use the Seedling Growth Chart to keep track of its growth.

Dig a hole

The hole should be big enough for the root system to fit comfortably with space around it. It is good to break up the soil in the hole a bit. When removing the soil, it is best to keep the rich topsoil separate from the subsoil. Place a small amount of the topsoil in the bottom of the hole to help the roots establish themselves. If the trees you are planting have a clump of soil around the roots, leave it on; they will like having some of that soil in their new home.

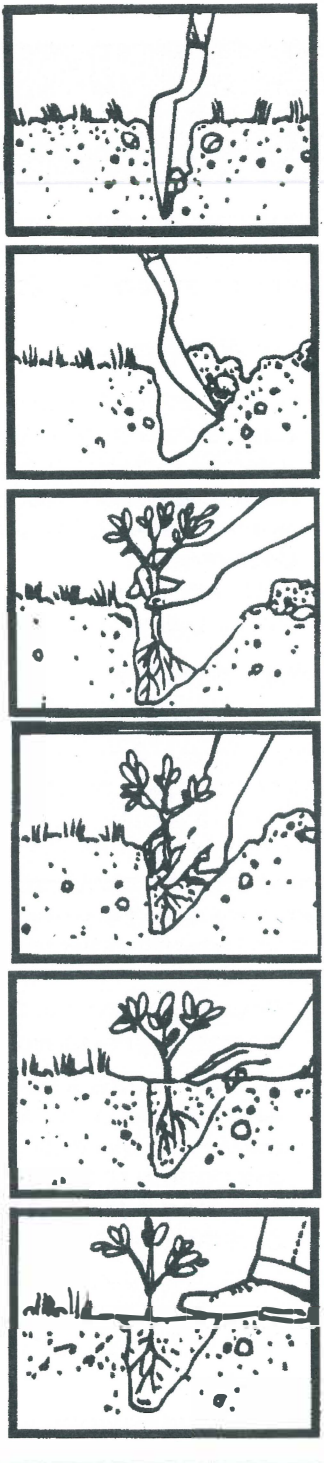
Place roots in the hole

Plant them pointing down as much as possible. The most important thing to remember during planting is to keep the roots from drying out from too much exposure to air. This is especially true when planting bare-rooted trees. If roots have soil around them, they tend to stay moist longer. Make sure the roots are not tangled, turned up or too cramped.

Fill in the Hole

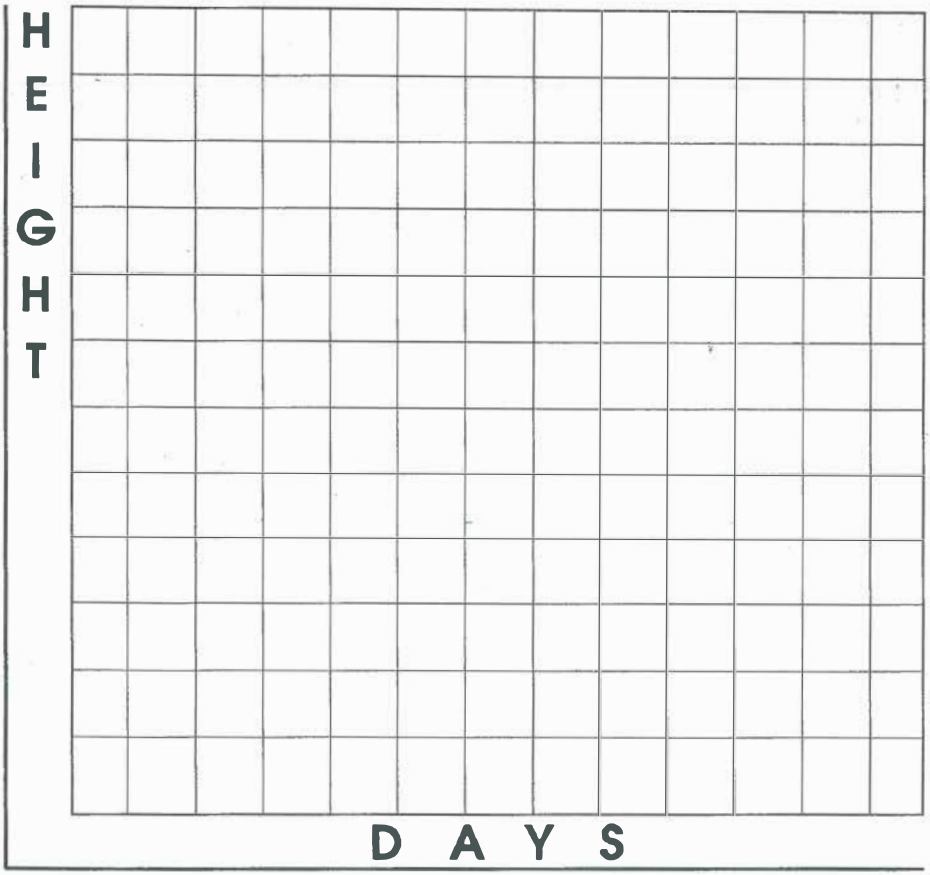
Crumble the dirt as you fill in the hole, using the topsoil first. Be sure to hold the tree so that the roots will be covered and the base of the trunk is at ground level. Continue crumbling dirt and packing it down with your hand. Make sure that the filled hole is level with the ground around it. If the soil is lower than the ground, water will puddle and can drown the roots. If the soil is higher, water will run off without soaking in.

Bare-rooted seedlings will need more care and protection during the first year. Surround the saplings with a mulch or ground cover to help them retain moisture and acquire nutrients. Protect them from wildlife or domestic animals.



*Adapted from: Classroom Preparation Information Kit, by Michael Soule, "For Every Child a Tree," UNEP Program, UNESCO, Spring 1983.

Seedling Growth Chart



Type of seed: _____

Date planted: _____

Covered with _____cm of soil.

Date seed germinated: _____

Hours required for seed to germinate: _____

Date when leaves reached the surface: _____

How many days after germination did leaves reach the surface? ____

On the last day of observation, the plant is _____ tall. This took _____days from the time the seed was planted.

Which Tree?

Each type of tree is unique. Its leaves, bark, seeds, branches, buds and silhouette are like no other kind of tree. That can make trees difficult to identify.

By carefully looking at the shape and colour of leaves, smelling the fragrant sap and feeling the texture of the bark, you will notice the differences in each tree. Record your observations in a tree identification book–this will help you to easily identify trees in your area.

A sample of how your tree guide might look is shown here. Include this information for each tree in your book. You can compare your tree guide with those of other Junior Forest Wardens from other parts of Canada at campouts.

You can also ask your leader for a copy of the Junior Forest Wardens Key to Alberta Trees*. This tree key will help you identify the many varieties of trees in Alberta. (*Available from your regional consultant.)

Identification Tips

Fingertip Identification*

Try this activity to learn about the types of Alberta conifers.

Pick up samples of fallen leaves on the ground below evergreen trees. Look at the shape and arrangement of the needles. Are they single needles or in clusters of two or more along the branch?

Place a needle between your thumb and forefinger. Try to discover its shape by rolling it. Now identify it.

Identification Key:

1. Needles attached singly on a branch:
   - if needle rolls easily, is 4-sided and feels square–it is a **spruce**
   - if needle does not roll easily and feels flat–it is a **fir**
2. Needles attached in bundles of 2 or more:
   - if there are 2 to 5 needles in a bundle, and when pinched together they form a circle or a pie–it is a **pine**
   - if there are 10-40 needles in a cluster on a short spurshoot higher on the branch, with needles attached singly toward the tip of the branch–it is a **larch.** (Unlike other conifers, larch lose their needles in the winter.)

*Finger Tip Identification of Coniferous Trees, by Joy Finlay, Appen Productions.

More Identification Tips

These are some of the common terms used when describing leaf shapes to assist in identifying trees.

Alternate

Leaves placed singly at different heights along the stem.

Opposite

Two leaves originating at the same point on opposite sides along a stem.

Whorl

Three or more leaves or leaflets originating from the same node. The node is the place on the stem from which the leaf grows.

Compound

Leaf made up of several leaflets. A leaflet is the blade of a compound leaf attached to a common stem.

Source: Guide to the Common Native Trees and Shrubs of Alberta, Alberta Environment.

Tree Scramble

Can you find the different types of trees hidden here?

How many lose their leaves in the fall?

How many are evergreen trees?

My Tree Book

Tree Name:_____

Leaf: Draw or tape the leaf here.

Bark: Make a bark rubbing or find a piece of bark and tape it here.

Write three words that describe the bark. Is the bark the same on all parts of the tree? If not, how does it change?

Seeds: Draw or tape a seed here. If it comes from a cone, draw the cone.

How are the seeds dispersed? Does the tree use other ways to produce more trees? If so, what are they?

Leaves: Circle the type of branching pattern of your tree:

Opposite Alternate Whorl Compound

Shapes and Patterns: Draw a silhouette of your tree or shrub. Draw and label two patterns found on your tree or shrub.

Buds: Draw how the buds are arranged on the tree.

Are the buds the same all over the tree? Label the terminal and lateral (side) buds.

Leaf scars are marks left on a twig where the base of a leaf was attached. Look for them and draw their shape.

Find the terminal bud scars. The terminal bud is located at the end of a branch or stem.

Crush the bud and smell it. Write a few words to describe the smell, how it feels or the appearance.

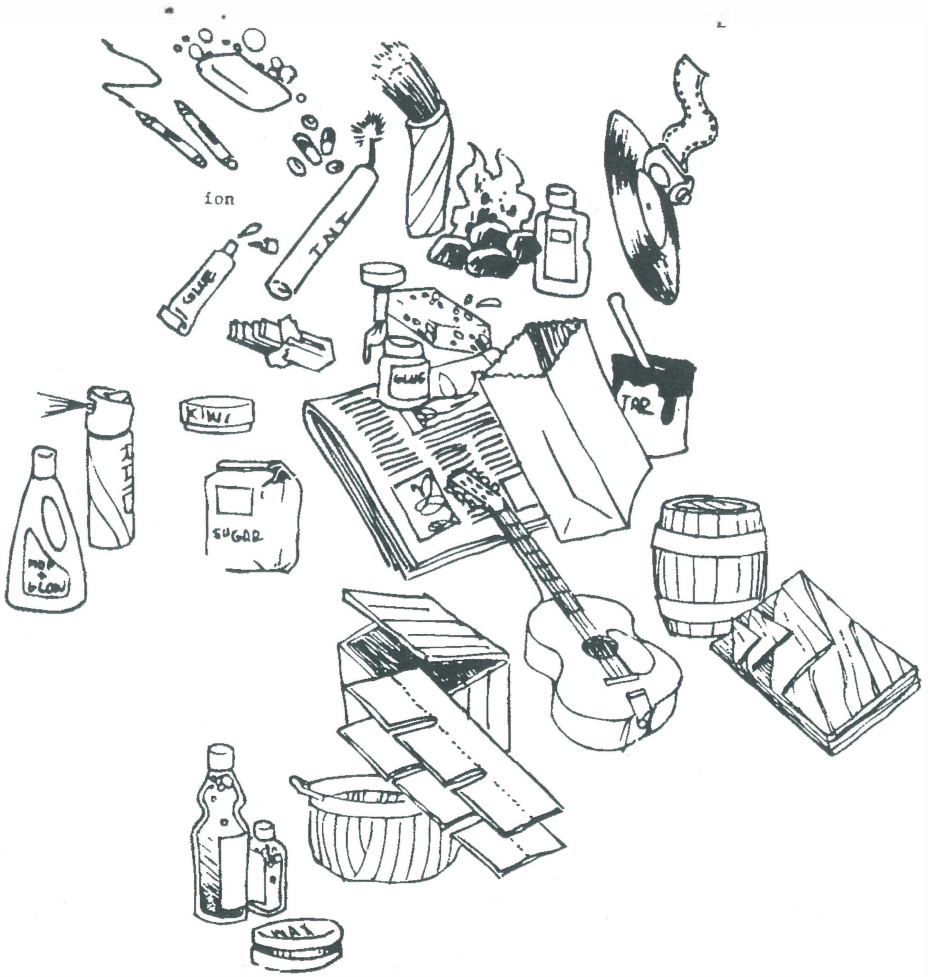
Age: How old is the twig?

Environment: Draw the area in which your tree lives.

Forests and Me

Imagine a world without chewing gum, boats, wooden toys, furniture, books, newspaper, magazines, Christmas trees and maple syrup. That's what a world without trees would be like. There would be no trees helping to conserve soil, and to provide pure water and oxygen. No beautiful woodlands to explore. Imagine your home and school without wood.

Look at this illustration. Which of these products are made from wood? Can you think of others?



Answer: All of these products are made from wood.

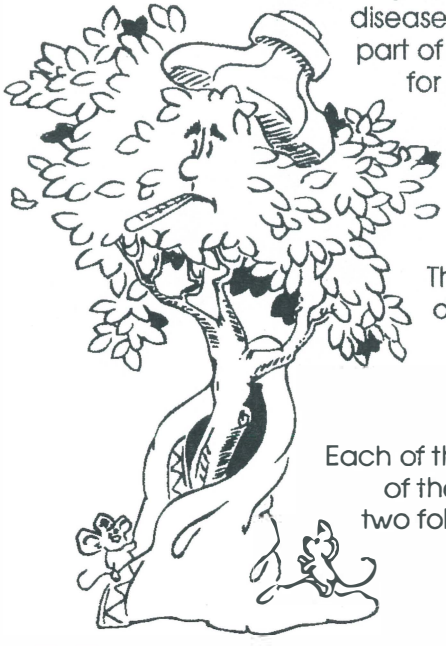
Forest Diseases

Have you ever seen a tree with fungi or mistletoe growing on it? A tree turning brown from too little water? Or from acid rain? Each of these trees has a disease.

There are two types of diseases that harm trees.

Non infectious diseases are caused by the nonliving environment such as frost, heat, too little or too much water, or industrial pollution. Non infectious diseases do not multiply or spread. Injuries are often temporary. Damage is usually most severe in seedlings. Controlling the cause of non infectious diseases is usually successful in a tree nursery, but is difficult in the forest.

Infectious diseases are caused by living organisms such as fungi and mistletoe. Infectious disease can spread over the years, and kill trees or damage large numbers of trees.



Many native infectious diseases have been part of our forests for many years. However, diseases that are brought from other forest regions can eliminate a tree species. White pine blister rust and Dutch elm disease are two examples.

There are three types of infectious diseases:

- foliage (leaf and cone)
- stem and branch
- root

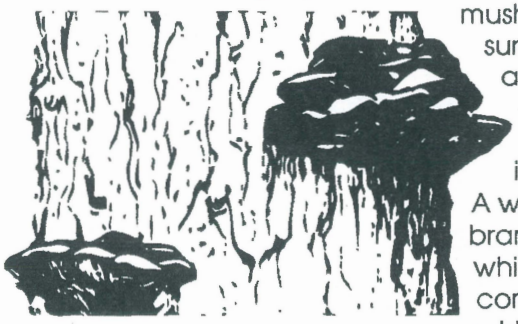
Each of these are described here with examples of the more common diseases. Learn about two foliage and six stem and branch diseases in your forest region.

Foliage/Needle Cone Diseases

Commonly displayed as leaf spots, needle or leaf rust, needle casts and leaf blight, these diseases attack the leaves or needles of trees. They cause unsightly spots or dead patches on leaves or needles, and cause the leaves, needles or cones to drop sooner than normal.

Stem and Branch Diseases

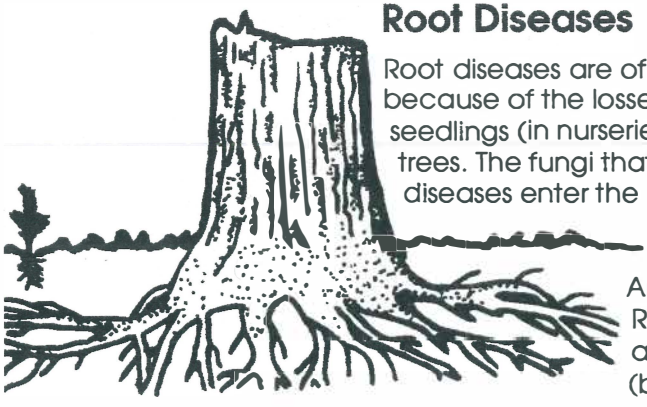
Stem and branch diseases are responsible for the greatest loss of forests from disease in Canada. The most important of these are the wood decay fungi that affect millions of trees in immature and mature forest. When decay in a tree or log is well-developed, the fungus produces a fruiting body, known as a conk or mushroom, on an exposed surface. The spores produced are blown by the wind to infect other trees through wounds, dying branch stubs and insect holes.



A widespread group of stem and branch diseases are the cankers, which kill the bark. Some common canker diseases are white pine blister rust, chestnut blight and hypoxylon canker of aspen.

Dwarf Mistletoe

This parasitic flowering plant affects primarily the lodgepole and jack pine, extending from the coastal range in B.C. across the prairie provinces. Wood from infected trees is of substandard quality for commercial use. Dwarf mistletoe infection results in abnormal branching to form witches' brooms, large swellings on the stem and branches, and stunted growth. When the dwarf mistletoe berries mature in late summer or fall, the seeds are forcibly thrown for distances up to 15 m. The seeds are surrounded by a sticky material and readily adhere the surface on which they land. Presently, the only effective method of control is to remove infected trees to prevent the disease from spreading. Affected trees on clearcut areas are cut or burned so the seed cannot spread.



Root Diseases

Root diseases are of concern to foresters because of the losses they cause in seedlings (in nurseries) and in immature trees. The fungi that cause these diseases enter the roots, killing them and thus the tree. Three examples are Armillaria root rot, Red Ring Rot (conifers) and False Tinder Conk (broadleaf trees).

Controlling Infectious Diseases

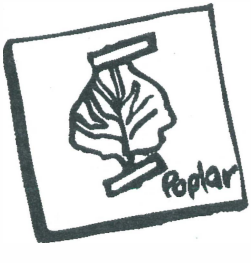
Forest tree diseases are considered to be important only when trees are killed or where a large portion of wood is damaged. There are several choices for deciding how to control these diseases.

- Diseases can be controlled by applying protective chemicals.
- Diseases can be prevented from attacking trees by harvesting susceptible species and replanting with more resistant tree species, such as in the case of hypoxylon canker.
- Diseases can be controlled by cutting out the infected trees.

Make a Disease Collection

Decays and Decay Fungus: Cut a piece of the diseased wood from an infested tree. Dry and label the specimens.

Leaves and Needles: Press and dry leaves between weighted newspaper. Mount on a sheet of cardboard with tape or glue. Label the collection. Spray coniferous specimens with a clear varnish to prevent the needles from dropping.



Conks: Break the conk off the tree. Dry, and label. Or, cut a cross-section and dry, mount and label.

Forest Insect Pests

Forest Insect Pests

Forest insect pests slow tree growth, reduce wood quality and can cause trees to die.

Nature's Balance

Although insects are always present in the forest, they are normally kept under control by natural enemies and poor weather conditions. Sometimes a disturbance shifts the normal balance of nature and an outbreak or infestation of insects occur, injuring or killing many trees. Disturbances may be natural (e.g., weather), by people (e.g., logging) or other (e.g., fire). Anything that weakens trees makes them more susceptible to pests. Insects and diseases often become problems when a site is replanted with a new tree species or with only one kind of tree where there were once several species.

Early Detection Is Important

It is important to identify a problem as early as possible so that steps can be taken to correct it. Forest insect problems are detected by specialists, observation by foresters and by others living or travelling in the woods.

Control Is Sometimes Needed

Foresters try to control pests by preventing the trees from becoming attractive to pests. For example, logs harboring insects are removed from the forest before the young insects emerge and attack new trees. Sometimes, however, infestation occurs in spite of preventative measures, and direct action may be needed.

Chemical Control

In cases of severe damage, it may be necessary to stop an outbreak quickly by using chemicals, usually from the air. Thousands of acres of forest in New Brunswick were sprayed in recent years to combat the spruce budworm, and outbreaks of several other forest insects have been treated across Canada. At the present time chemical control is not used in Alberta as there is a moratorium on the use of pesticides.

Correct timing of pesticides is necessary to ensure that the pest is at the most susceptible state. Careful selection and use of chemicals is important–those that kill only the insect pest and do little harm to fish and wildlife are the most desirable.

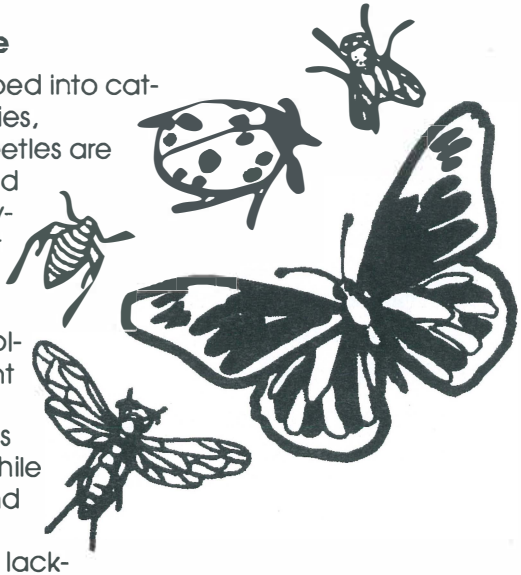
Biological Control

This control method involves the introduction of **Predators** (e.g., insect-eating birds, small mammals such as shrews, and some spiders and mites) and **Parasites** (organisms that live within the host) to attack and kill insect or disease pests. One method of using biological control is by adjusting the environment to help predators, such as providing good nesting sites for insect-eating birds. Biological control methods are constantly being researched to ensure their introduction will not be a danger to the environment, or to public health and safety.

What are insects?

There are about 10-30 million different kinds of insects in the world that have been identified. All adult insects have six legs, one or two pairs of wings, and hard bodies divided into head, thorax and abdomen. Young insects (grubs, larvae, caterpillars) are often different from their parents. For them, complete metamorphosis occurs through four distinct stages: eggs, larva, pupa and adult. Some insects go through simple metamorphosis, going from egg to nymph to adult. The wooly aphid is one example. Use the **Tiny Animals** and **Common Insects Key** on pages 40 and 41 to help identify insects.

Insects grouped by appearance

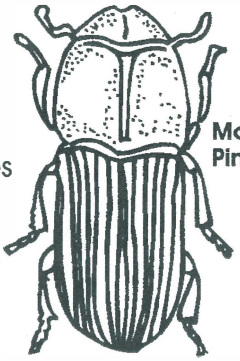


Insects are commonly grouped into categories such as beetles, butterflies, moths, wasps, flies and bugs. Beetles are hard-bodied, with wings that fold over their backs under hard covers. Many are plant feeders, but some prey on other insects or are scavengers. Butterflies and moths have patterned, often colorful wings. Their larvae are plant feeders. Bugs include sucking insects like aphids. Some species of wasps and flies infest trees, while others attack harmful insects and are beneficial. Spiders are not insects, and differ from them by lacking antennae and wings, and having eight legs rather than six. Also, most spiders have only two body parts.

Insects Grouped By Damage and Habit

Many insects are broadly grouped according to the part of the tree they attack or the method of their attack. The main groups are described here.

Bark Beetles



Mountain Pine Beetle

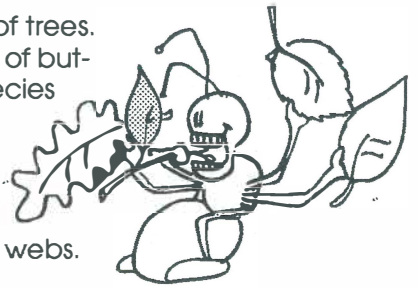
These insects are very destructive. Important examples include the eastern larch beetle and allies, spruce beetle and mountain pine beetle. They tunnel in or just under the bark, cutting off the sap flow. Trees or logs attacked by bark beetles can be identified by little pitch masses or piles of boring dust on the bark and by tunnels or galleries constructed through or under the bark.

Many bark beetles prefer trees under stress (e.g., from drought or disease) or dying trees (e.g., fire-damaged trees, windfalls, logging slash or logs). When beetle populations are large, a few species can seriously damage healthy timber. To help avoid infestations, loggers try to remove infested trees promptly from the woods, and leave a minimum amount of slash and other debris in which some species of beetles breed.

Woodborers

Ambrosia beetles, flat-headed and round-headed woodborers, and wood wasps attack dying trees and logs. They bore in wood, leaving tunnels that reduce the quality of lumber cut from infested logs. If logs are removed from the woods soon after cutting, damage is usually avoided. Sometimes log decks in mill yards are kept wet by sprinklers to discourage insect attack, or they may be sprayed with chemicals.

Defoliators

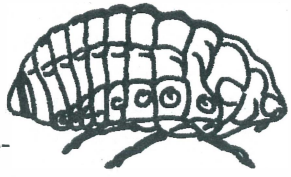


Defoliating insects feed on the leaves of trees. These include the larvae or caterpillars of butterflies or moths, sawflies and some species of beetles. In large numbers, they can strip many thousands of hectares (acres) of trees in a single season. Some feed alone, others in groups, and some build protective, easily seen webs.

Some common examples are spruce budworm, eastern black-headed budworm, hemlock looper, forest tent caterpillar and larch sawfly. The damage is usually done by the larvae of these insects. Leaf beetles are an exception; both the adult and larval stages cause damage.

Sucking Insects

Balsam Wooly Adelgid



These insects attack leaves/needles or roots. They suck the sap, discoloring the foliage and weakening or killing the trees. They are usually globular, brown or green, and have thin spindly legs. Some are covered with a white, woolly wax secretion. Spruce gall adelgids cause cone-like growths on branch tips. The balsam woolly adelgid is a serious pest of true firs. It appears as tiny woolly masses on the trunks of trees, and causes swellings of the twigs and buds in the crown.

Cone and Seed Insects

Eastern Spruce Budworm

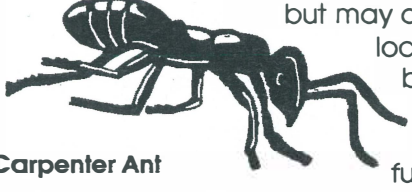
These are mostly various species of flies, moths and wasps. They reduce seed crops and, therefore, the potential for new trees. Boring dust, pitch or webbing on cone surfaces are often indications of infection. Examples of such insects are the spruce cone maggot, eastern spruce budworm and jackpine budworm.

Terminal and Shoot Borers

Terminal insects attack and kill the growing tips of trees. This reduces the tree's growth. Infested leaders become yellow or brown and have a characteristic droop. Examples of these insects are the white pine weevil and European pine shoot moth.

Wood Product Pests

Termites and carpenter ants attack wood under moist conditions. They feed on and build nests in dead wood as a rule, but may also use living trees. Depending on the location, they can be serious pests to buildings. Powderpost termites attack dry wood and can cause severe damage to floors, woodwork and furniture. Boring holes in wood that is in salt water, such as logs and pilings, are caused by the shipworm or toredo. The shipworm and toredo are relatives of the clam.



Carpenter Ant

Forest Insect Damage Key

Use this key to help you identify some of the damage caused by various insect pests.

Tree Species Affected:

Spruce–see 𝔸
Pine–see 𝔹
Fir–see ℂ
Larch (Tamarack)–see 𝔻
Poplar–see 𝔼
Birch–see 𝔽

CONIFEROUS TREES

Spruce

𝔸 **Needles eaten**

✓ Webbing or silk present:

Spruce Budworm–Terminals of tree reddish or brownish, often more pronounced toward the top; needles webbed together.

✓ No webbing or silk:

Sawflies–Needles eaten off, often leaving short stubs.

Animal Browsing–Needles not eaten off except at the end of branches. Young trees may be cropped off at the top.

𝔸𝔸 **Needles not eaten**

✓ Tips of twigs swollen:

Spruce Gall Adelgids (Aphids)–Tips of twigs swollen with hard green or brown cone-like galls.

✓ Tips of twigs not swollen:

Bark Beetles–Entire tree dying, crown yellow or reddish-brown colour. Boring dust around the base of the tree, tunnels on the inside of the bark.

Spruce Weevil–Part of tree dying. Leader dead, upper whorls of side branches dead, grubs and tunnels under the bark.

Pine

B **Needles Eaten**

✓ Needles chewed off:

Sawflies–Short needle stubs left on the twigs.

Animal Browsing–Needles not eaten off except at the end of the branches. Tree appears cropped off at the top, usually on young trees (low trees).

BB **Needles not eaten**

✓ Entire tree dying:

Bark Beetles–Boring dust around the base of the tree.

✓ Part of tree dying:

Spruce Weevil–Leader dead, upper whorls of side branches dead, grubs and tunnels under the bark.

Pine Terminal Weevil–Leader always affected–leader dead, upper whorls of side branches dead. Grubs in tunnels in pith.

Pitch Nodule Maker–Leader not usually affected–hollow pitchy masses at crotch of isolated dead branches.

Fir

C **Needles eaten**

✓ Webbing or silk present:

Spruce Budworm–Terminals of tree reddish or brownish, often more pronounced toward top, needles webbed together.

✓ No webbing or silk:

Larch Sawfly–Needles eaten off, often leaving short stubs.

Animal Browsing–Needles not eaten off except at the end of branches, usually on young trees.

CC **Needles not eaten**

Bark Beetles–Entire tree dying, crown reddish-brown. Boring around base of tree, tunnels on the inside of the bark.

Larch (Tamarack)

D **Needles eaten**

Larch Sawfly–Tips of branches curled like a hook or question mark.

DECIDUOUS TREES

Poplar

E **Leaves eaten**

Large Aspen Tortix–Some leaves rolled or tied together with silk. If damage is severe, silk is abundant.

✓ Leaves not rolled or tied with silk:

Forest Tent Caterpillar–Entire leaves eaten, large hairy caterpillars (white keyhole spots).

Poplar Leaf-Eating Beetles–Only upper or lower surfaces of many of the leaves eaten, black grubs may be present.

EE ✓ Leaves not eaten:

Poplar Borer–Injury to stems. Holes boring in main trunk, boring dust and gummy masses present.

Birch

F **Tip of Tree dying**

Bronze Birch Borer–tips of tree dying, borers in galleries beneath bark.

Notes

Sources: "Forest Insects", and "Some Representative Forest Insects" were excerpted from "Forest Pests", produced by the Canadian Forestry Service for the Junior Forest Warden Association. Revised 1982. "Biological Control of Insect Pests" is a publication of the Canadian Forestry Service. *Your club can write to*: Enquiry Centre, Department of Environment, Ottawa, Ontario, K1A 8H3 for the Fact Sheet series. Further information is also available from your local Forestry Service or from your regional JFW consultant.

A Key to Tiny Animals

Use this key to help you identify tiny animals that are not insects but are often confused with insects. Read the description and look down the list to find the number that matches.

1. Soft to touch ..... Go to: #2
Hard outer shell ..... Go to: #3

2. Feels wet ..... Go to: #4
Feels dry ..... Go to: #7

3. Has a coiled shell ..... Snail
Has segments..... Go to: #5

4. Has segments ..... Earthworm
Does not have segments ..... Slug

5. Has no legs ..... Pupa stage of insect
Has 6 legs ..... Insect
Has 8 legs ..... Spider
Has many legs ..... Go to: #6

6. Long with one pair of legs on each segment ..... Centipede
Long with two pairs of legs on each segment ..... Millipede
Short with one pair of legs on each segment
(rolls up when disturbed) ..... Snowbug
Flat with 14 pairs of legs ..... Wood Louse

7. Has 8 legs ..... Spider
Has 6 legs with claws and 10 sucker feet ..... Caterpillar
Has 6 legs ..... Go to: #8

8. Very small, white, in an ant's nest ..... Ant Pupa
Large and curled ..... Beetle Larva
Thin, straight, in earth ..... Wireworm

A Key to Common Insects

Use this key to help you identify insects. Read the description and look down the list to find the number that matches.

1. Has wings ..... Go to: #2
No wings ..... Go to: #3

2. One pair of wings ..... Fly
Two pairs of wings ..... Go to: #4

3. Tiny, in animal fur or on birds ..... Flea
Large, with very large back legs ..... Grasshopper/Cricket
Small, red or black ..... Ant
With a pair of "pincers" at end of tail ..... Earwig

4. Pairs of wings that are similar ..... Go to: #5
Pairs of wings that are different ..... Go to: #6

5. Wings are transparent ..... Go to: #7
Wings are covered with fine powder ..... Go to: #8

6. Short body and hops when moving ..... Bug
Long body and hops when moving ..... Grasshopper
Does not hop. Upper wings completely hide lower wings when at rest ..... Beetle

7. Shiny narrow waist ..... Bee or Wasp
Large narrow body with no waist ..... Go to: #9

8. Wings fold together above the back when at rest ..... Butterfly
Wings lie flat when at rest ..... Moth

9. Wings held horizontally while at rest ..... Dragonfly
Wings fold together above the back while at rest ..... Damsel Fly

Forest Insect Pests

Name of insect: _____

Draw the insect:

What does it eat?

Where does it live?

Does this insect damage trees or help them?

At what stage in its life cycle does this insect damage trees?
What does it do?

What can foresters do to reduce damage by this insect?

Forest Insect Pests

Name of insect: _____

Draw the insect:

What does it eat?

Where does it live?

Does this insect damage trees or help them?

At what stage in its life cycle does this insect damage trees?
What does it do?

What can foresters do to reduce damage by this insect?

Forest Insect Pests

Name of insect: _____

Draw the insect:

What does it eat?

Where does it live?

Does this insect damage trees or help them?

At what stage in its life cycle does this insect damage trees?
What does it do?

What can foresters do to reduce damage by this insect?

Ranching and Rangelands

What is Range?

Range is a land area covered with native plants that provides suitable habitat for livestock and some wild animals. Range is used to raise livestock, for water storage, for recreational activities and for some oil and gas drilling.

What is Range Management?

Range management is the care and conservation of the rangeland to get maximum use of the area without endangering the soil and water resources and other important uses of the land. Some reasons for range management are:

- Balance the number of animals with the forage supply.
- Graze animals during the proper season.
- Keep grazing animals properly distributed over the range.
- Keep the range covered with good forage plants.
- Increase the storage of water in the soil and regulate the flow of water in the streams.
- Prevent soil erosion.

Water For All

Water is important to plants, animals and people. Our earth has a limited amount of clean water to meet all these needs. Because we only have so much water we need to practice water conservation. It is very important to keep our water clean (e.g., don't use soap in a stream) so that nature is recycling clean water back to earth.

How many ways can you think of to conserve water in your home? School? JFW camping trips? Try to make water conservation part of your life. The following experiments will help you answer these questions.

1. **Water Count** (an all-day project)

   As soon as you get up in the morning, put a little notebook and a pencil in your pocket.

   All day long, make a note every time you use some water. Do not forget. At the end of the day, see how long your list is. Are you surprised at how many different ways you have used water? How many litres do you think you used? (Do you know that each flush of most toilets takes 30 litres (eight gallons) of water?)

2. **Bath or Shower?** (a five-minute project)

Which uses more water, a bath or a shower?

To find out, plug the tub drain and take a shower. Is the shower water you caught in the tub as deep as the baths you usually run?

3. **Tracking Water Pollution** (an afternoon project)

First, find a natural water source near you. If you live in the country, it might be a mountain brook or a creek. If you live in the suburbs, it might be a marsh or a ditch by a roadside. Take a walk along that water.

As you walk, write down all the pollution that you can see–garbage, sewage, oil, chemical waste–and the place where you found it. Germs and many chemicals are invisible. When you get home, make a map showing the water you followed and the places where you found pollution Once you have a water pollution map, you can begin to track down some of the sources of pollution. It may be a factory that is dumping waste into a river, or it could be a picnic place where people throw away their paper plates. Whatever the source, if you can find it and report it to the proper authority, you will have taken the first steps to cleaning up the water.

Celery Tree

Have you ever wondered how a tree gets water from the soil? Try this experiment to see how trees drink.

You will need:

- a knife
- celery stalk with leaves
- 2 drinking glasses
- food colouring (2 colours)
- spoon

Trim away the bottom of the celery. Slice halfway through the center of the celery stalk with a knife. Pour about 350 ml of water into each glass. Add a different color of food coloring into each glass. Stir well.

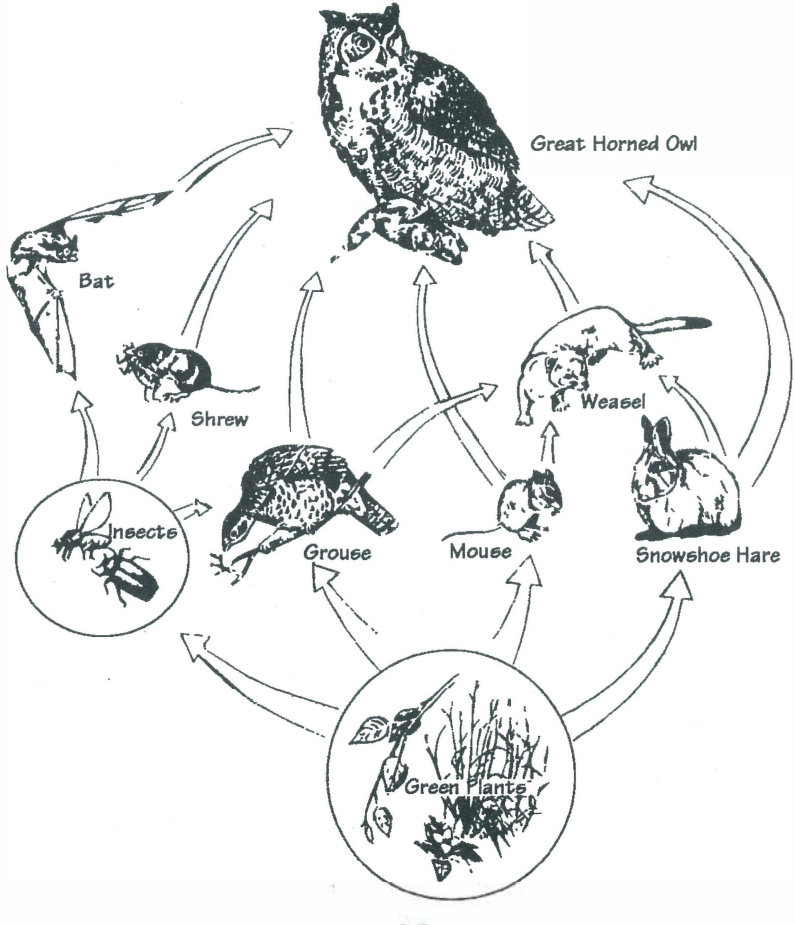
Place the two glasses next to each other. Put one end of the cut celery stalk into one glass and the remaining end into the other glass.

Let the celery stay in the food coloring for at least three hours. When you come back, you will see how the food coloring in the water travelled up the celery stalk and colored the leaves. This is how a tree gets water into its branches and leaves.

Wildlife And Me

Animals are important to people in many ways. Not only do we enjoy animals, birds and fish for their natural beauty and mystery, but we also use animals in many ways in our everyday life. Years ago, Native people and pioneers used wild animals for food, clothing and shelter in order to survive. In our modern times, we rarely use wild animals for food, clothing and shelter.

Animals, like trees, are a renewable resource. But they do have limits. They cannot reproduce enough offspring to maintain their numbers if their habitat is destroyed, or if environmental pressures become so great that they are unable to reproduce. The life cycle shown here illustrates just one example of how wildlife is important.



Making Paper

You can make your own paper by recycling paper from your home or school. Before you begin this activity, think about what recycling means. How does recycling save resources and energy? Why should we buy recycled paper?

Recycling

This is the symbol for recycling. It is called a "Mobius Loop". This symbol can be found on paper products, aluminum cans, some plastic containers, glass bottles and many more things. Think of some examples of how things you use everyday can be recycled or reused.

Environmental Choice

Look for Environment Canada's new Environmental Choice Ecologo. This symbol is found on products that are safer for the environment. Each bird represents a part of society–consumers, industry and government. Together the birds form a maple leaf, Canada's national symbol.

Junior Forest Wardens and Recycling

In 1992 the Junior Forest Warden Provincial Advisory Council in Alberta developed a mobius loop to use on Junior Forest Warden paper products.

Making Recycled Paper

You will need:

- blender
- 500 ml warm water
- rolling pin
- 2 squares of white felt cloth
- large pan to catch water
- a piece of screen (an old window screen works well)
- several sheets of newspaper or letter paper, old bills, flyers, etc.
- 10 grams of cornstarch (about one large spoonful).

Place a half sheet of newspaper, torn into 1-inch strips, the cornstarch and water in a blender and mix until a soupy mixture is achieved. Hold the screen over a large pan. Pour the mixture evenly over the screen. Allow water to drain. Place one piece of felt on top of paper "mush" and press down. Flip over and carefully remove screen. Cover with felt. Roll with rolling pin to remove excess water.

Let the paper dry for a few days or iron on low with your paper placed between a tea towel. Use your finished paper for a letter, card etc.

Notes

Woodstravel

In the Woodstravel program you will learn how to enjoy being in the out-of-doors safely.

Some of the activities you will learn are:

- Emergency First Aid
- How to dress appropriately for woodstravel activities
- Cooking over a campfire
- How to plan campout menus
- How to read a map and find your way around in the outdoors
- How to navigate using a compass
- How to prevent hypothermia
- How to use a knife safely
- How to tie knots and lashings

You will also participate in a variety of dayhikes and campouts.

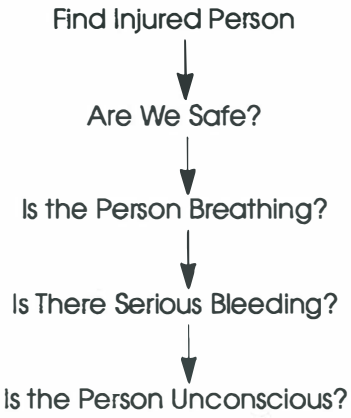
Remember, when you are hiking in the woods:

"Take only pictures, leave only footprints!"

First Aid

First Aid Checklist

Use this checklist along with what you have learned in your first aid course, to help an injured person.



Here are the questions to ask yourself and what to do at each step of the way. Take a first aid course to learn what to do.

Are We Safe?

Make sure that you and the injured person are safe from further injury. Check for life-threatening situations.

- How was this accident caused?
- Are we in danger? Can I remove us from the danger, or the danger from us?
- Is the injured person breathing? Is there serious bleeding?
- How can I get help?

Is The Person Breathing?

Check the injured person's airway. Not breathing? Start rescue breathing now. Choking? Give first aid for choking. Unconscious? Maintain an open airway by placing the injured person in the recovery position. Be aware of neck or spine injuries.

Is There Serious Bleeding?

Control severe external bleeding quickly.

- Apply direct pressure to the bleeding area with the cleanest material available.
- Send someone for help.
- Have the injured person lie down and keep still.
- Apply a pressure bandage.
- Elevate the injured area.
- Keep the injured person warm and calm.
- Do not give food or fluids.
- Check the injured person's breathing frequently.
- Get medical help.

Is The Person Unconscious?

- Send someone for help.
- Breathing? Check often. Keep airway open.
- Do **not** move...the spine may be injured.
- Loosen tight clothing.
- Check for a Medical Alert bracelet or necklace and read it.
- Keep the injured person warm.
- Stay with the injured person.
- Do not give food or fluids.
- Get medical help.

What To Do When You Get Cold

Stay warm and you will enjoy winter outdoors.

There are three cold injuries that often go together in cold weather: Frostnip, Dehydration and Hypothermia.

Frostnip

The skin turns white and becomes numb. Re-warm immediately with your hand. Check yourself and your buddy every few minutes in cold weather. Tell your leader if you think you have frostnip, or if you feel cold.

Dehydration

You are losing more water than you are drinking. Drink more! Try to drink a cup of water every half hour.

Hypothermia

A different kind of cold feeling—so cold that you are cold both inside and out. You may shiver very hard or you may have trouble doing up your zipper or tying shoe laces. If you are cold, tell your leaders immediately. Put on more clothes. Jump up and down or run around to try to warm up. Hot drinks are helpful too.

How To Stay Warm When It's Cold Outside

1. Stay healthy—eat properly. An inadequate meal makes it harder to stay warm in the cold. Bring snacks and lunches on your trips. Have a good sleep or a rest before going into the cold. If you have a cold or the flu, get well before going on a major trip out trip.
2. Drink plenty of water all day long. A cup of water every half hour is not too much.
3. Dress in layers and wear clothes that will keep you warm and dry and are windproof from head to toe. Carry extra clothes and rain or snow gear in your daypack at all times.
4. Too hot? Cool off by taking off a layer or two.
5. When you come to a stop, do you know how to keep warm? (You can put on more clothes.) Do you have clothing to change into if you are wet with sweat? Can you start a fire to warm yourself? Do you know where to find a wind–protected spot? Learn how to do these things from your leader, or by reading your JFW manual and practising what you have read.
6. Find shelter during strong winds, unless you have very windproof clothes, from head to toe.
7. Feeling cold? Take action now! Put on more clothing, build a fire, put up your shelter and make some hot drinks.
8. Tell your leaders if you've had frostnip or frostbite before this trip. If you have, you will get cold easier so you'll have to be more careful.
9. Uncontrollable shivering is your last warning! **Stop Further Heat Loss! Get Warm Now!** Tell your leader "I can't stop shivering, help me please!"

Thirsty? Keep Drinking

We need to drink lots of water everyday, especially when we are camping and exercising hard. You should drink at least 1 to 2 litres of water everyday, and much more if you are working and playing hard.

Whenever you go on a JFW day hike or campout, always bring a full water bottle. Your club should make sure there is a good source of water on all your trips, so everyone can drink as much as they need. Often when you are feeling very tired, all you need is a drink of water to "pick you up" and help you to feel energetic again.

What To Do When You're Too Hot

Sometimes you can get very hot, and not feel very good.

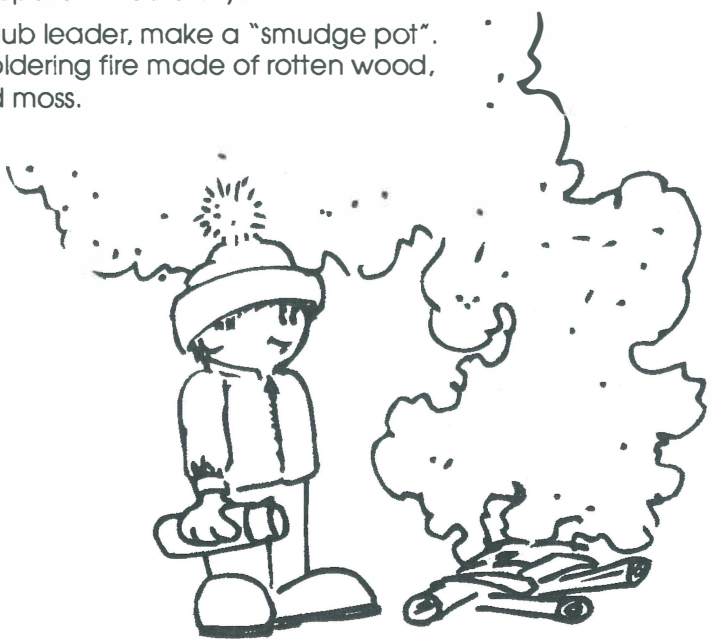
1. Tell your club leader exactly how you are feeling.
2. Sit down in a cool place.
3. Drink water.

Annoying Insects

Flies and mosquitoes are annoying. Their bites are itchy and can become infected.

How to stay bug-free!

1. Button up! Zip up! Close all openings in your clothing.
2. Wear long sleeved shirts and long pants.
3. Use insect repellent—carefully!
4. With your club leader, make a "smudge pot". This is a smoldering fire made of rotten wood, grasses and moss.



Outdoor Clothing

Keeping Warm

Here are some examples of clothing you can wear to keep warm. Experiment to see what works best for you.

Head:

Wear a warm, waterproof and windproof hat which covers the head and ears.

Neck:

Wear a scarf of wool or nylon to keep your neck warm. **Did you know** you can lose up to 70% of your body heat through your head and neck? This is because many of the blood vessels going to the brain are very near the surface of your skin.

Chest and Arms:

Dress in layers so you can add or take off layers to keep you feeling just right. Clothes with zippers in the front can be opened or closed to keep you at just the right temperature. Some clothes you can wear are:

- Warm underwear
- Thin wool shirt
- Thick wool sweater
- Wool coat or a ski jacket. The sleeves should be snug at the wrists.

Legs:

Pants that keep you warm, dry and windproof are a must. Shorts are fine for sunny summer days, but for cool weather try these kinds of clothing:

- Wool or polypropolene underwear
- Heavy wool pants
- Nylon wind pants
- Snowsuits

Feet:

Choose footwear that fits and that is just right for the weather conditions. Here are some ideas:

- One pair of good wool socks
- Snowmobile boots

or

- Two pairs of wool socks
- Rubber boots

or

- Wool socks
- Running shoes

Hands:

Mitts are warmer than gloves. Mitts should:

- Be easy to put on and take off.
- Have a wool liner and a nylon or leather overmitt.
- Stay found! Try tying a cord to your mitts and wear the cord around your neck inside your jacket.

Keeping Dry

Wet skin gets colder much faster than dry skin. Put on your raingear when the first drops of rain fall.

You can also get wet by sweating. When you know you will be working hard, you can prevent getting your clothes sweaty by taking off your clothing, one layer at a time. This is something you have to learn through experience. Try this sequence:

1. Uncover your ears
2. Uncover your neck
3. Uncover one hand
4. Uncover the second hand
5. Open your clothing at your neck
6. Open your clothing at your wrists
7. Remove your headgear
8. Remove one or more layers of clothing

If you find you've taken off too much you can put some clothes back on. You can cover your ears, your neck or put on your mittens.

Keep your hands and feet warm. Because your feet sweat, they are hard to keep warm. If your feet are warm and your body is dry, you will be warm. Try to always keep your hands warm, because you may need them to zip up your jacket or light a fire.

Keeping Safe From the Wind

Put on a windbreaker. If you don't have one, try to get out of the wind. Find a shelter to protect you from the wind.

When you are outside, your body–especially those parts exposed to the air–is affected by what is called wind chill. The wind chill factor is given as a still air temperature that has the same cooling effect on an exposed or inadequately protected human body as a combination of temperatures and wind. For example: If the wind was blowing at 20 kilometers per hour (km/h) and the actual temperature was 0°C, it would have the same cooling effect on you as if you were standing outside and the temperature was -9°C with no wind.

My Clothing	My Clothing Keeps Me:			How Did it Work?
	Warm	Dry	Windproof	
Sample: Sweater	✘			I was warm, but got wet.

Advantages and Disadvantages of Different Materials

Materials	Advantages	Disadvantages
Cotton	Comfortable	Soaks up water readily Air spaces become saturated and conduct cold.
Wool	When wet, not all air spaces clog with water and this retains some heat. For years, this was standard for winter clothing.	Some people have allergies to wool. Some wools are scratchy. Wool is heavy and dries slowly.
Pile/Fleece	Retains warmth when wet. Dries quickly. Very comfortable. Feels instantly warm. Light.	Bulky. Requires large stuff bag. Loft reduced in some pile when washed. Wind blowsthrough easily.
Down	Light. Easy to compress. Comfortable.	Loses loft dramatically if it becomes wet. Difficult to dry.
Olefin/ Polypropylene	Provides excellent water vapor transfer as sock liners and underwear.	Some skiers do not like silky feel.
Synthetic Fiberfill	Fibers absorb very little water. Retains loft when wet. Dries relatively quickly.	Bulkier and heavier than down. Wears out and loses loft quicker than well-cared for down clothes.

Use this chart to help you choose clothing that will be appropriate for the weather. The sample chart on the opposite page is provided for you to do a survey of your clothing in different weather conditions.

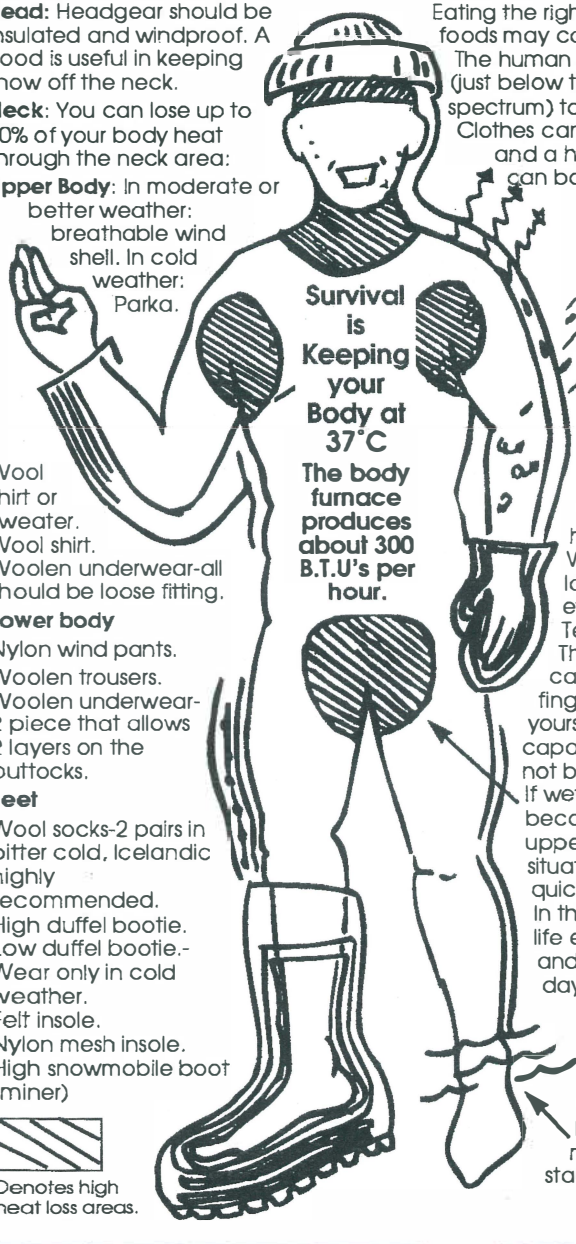
Dressing For The Cold

If arms and legs are well protected, the rest of the body, except perhaps the ears, is better able to handle cold for extended periods. If the core of the body is well insulated and the arms and legs are not, cold tolerance is low. Insulation of clothing depends on the air trapped in the clothing and between the different layers, not so much on the material itself.

Head: Headgear should be insulated and windproof. A hood is useful in keeping snow off the neck.

Neck: You can lose up to 70% of your body heat through the neck area:

Upper Body: In moderate or better weather: breathable wind shell. In cold weather: Parka.



Wool shirt or sweater.
Wool shirt.
Woolen underwear-all should be loose fitting.

Lower body

Nylon wind pants.
Woolen trousers.
Woolen underwear-2 piece that allows 2 layers on the buttocks.

Feet

Wool socks-2 pairs in bitter cold, Icelandic highly recommended.
High duffel bootie.
Low duffel bootie.-Wear only in cold weather.
Felt insole.
Nylon mesh insole.
High snowmobile boot (miner)

Denotes high heat loss areas.

Eating the right foods is important. Some foods may cause undesirable sweating.

The human body emits infrared radiation (just below the visible portion of the spectrum) to rid itself of excessive heat. Clothes can block much of this radiation and a highly effective reflective surface can bounce most of it back towards the body. An unclothed person gives off as much in the infrared as a reading light gives off in the visible range.

Condensation, as well as other moisture, reduces insulative value of clothing.

Between wet and wind, body heat loss is 270 times faster. Winds break up warmed air layers near skin and speeds up evaporation as well as cooling.

Test for hypothermia incapacity. The moment you find that you cannot touch thumb to the little finger, you'd better stop and warm yourself or you may loose the capacity to save yourself. You may not be able to light a fire.

If wet snow causes your clothing to become wet as high as here (inner upper thigh) a particularly hazardous situation develops as heat is so quickly sapped from the body.

In the moose spruce (boreal) forest, life expectancy with good clothing and no fire may be as short as five days due to loss of efficiency of clothing because of moisture build-up in clothes.

After knowing how to dress properly for the cold, the next most important skill is fire.

Foot emersion at -20° to -45° C may be tolerated for a half hour standing still.

Adapted From: "Clothing and Survival, Part 2", Mors Kochanski, Alberta's Fishing and Hunting Magazine, April 1987.

Daypacks

Always carry all of the food, clothing and equipment you will need for your hike. A daypack is just the right size to carry your own gear and some club gear.

Ask yourself these questions when you are deciding what to bring:

Clothing:
What clothing do I need to keep warm, dry and safe from the wind?

Food:
Will I need a lunch? Is a cookout planned? Did I pack a full water bottle?

Shelter:
Is there shelter where we are hiking? Should the club bring emergency shelter?

First Aid:
What first aid supplies should I bring? Should the club bring? Do I need to bring a survival kit?

Personal Items:
What other personal items should I bring: eating utensils? knife? book? JFW manual?

Club Gear:
What club gear should we bring? Cooking gear? Axes and saws? Program supplies? Books?

My Daypack List:

Survival Kits

"The more you know, the less you have to carry. The less you know, the more you have to carry." (New Zealand Survival Manual). There is no real substitute for knowledge and experience. There are a variety of kits available that could prove useless in a real emergency and could be hazardous in creating a false sense of security. Instead, focus on the things that have a real effect on your comfort. Clothing, big kitchen matches (waterproofed and in a waterproof container), a knife, first aid kit and a signal mirror.

If you understand and plan your outings you have taken the first step in becoming prepared to deal with major problems.

Practice using your kit before any actual survival situation occurs. Remove or add items that you need or don't need. The following is just one example of a survival kit that you could put together.

The "Keen's" Mustard Tin Survival Kit

You will need one large "Keen's" mustard tin–for drinking cup, cooking pot, tinder box and packing contents in.

First Aid Supplies:

- ☐ Polysporin antibiotic ointment
- ☐ Ten non-stick Telfa pads
- ☐ 20 Elastoplast knuckle bandages
- ☐ One package of Steri-strips for wound closures
- ☐ Tweezers
- ☐ A large sewing needle
- ☐ Fifteen to twenty metres of dental floss
- ☐ Ten assorted sizes of safety pins

Other Supplies:

- ☐ Duct tape–for first aid, broken axe handles, etc.
- ☐ Log book and pencil
- ☐ Candle
- ☐ Whistle
- ☐ Braided nylon fishing line, 15 m (50 ft.)–for fishing, sewing.

- ☐ Hooks, sinkers and lures for fishing
- ☐ Emery cloth glued to the bottom of the tin–for sharpening knife, striking matches.
- ☐ Signal mirror, small hole scratched in center. Taped in lid–for signaling, removing objects from eye.
- ☐ One quart Zip Lock baggie, waterproof–for carrying water
- ☐ Spare pocket knife, carbon steel, razor sharp.
- ☐ Spare simple compass. Liquid filled compass may damage contents.
- ☐ Ten "Oxo" cubes.
- ☐ Eight strands of brass snare wire that may double as a handle for the tin to use as a pot, snare or repair wire.
- ☐ 50 ordinary matches in case of loss of striker.
- ☐ 50 waterproof matches.
- ☐ One metabolic match or rare earth metal flint with florescent tag (check for aging).
- ☐ Pain killer tablets (optional).
- ☐ Florescent ribbon tag on outside of can to prevent loss.
- ☐ Mylar reflective survival space blanket.
- ☐ 2 large elastics, one to keep lid on can down, the other one to bundle tin and space blanket together.

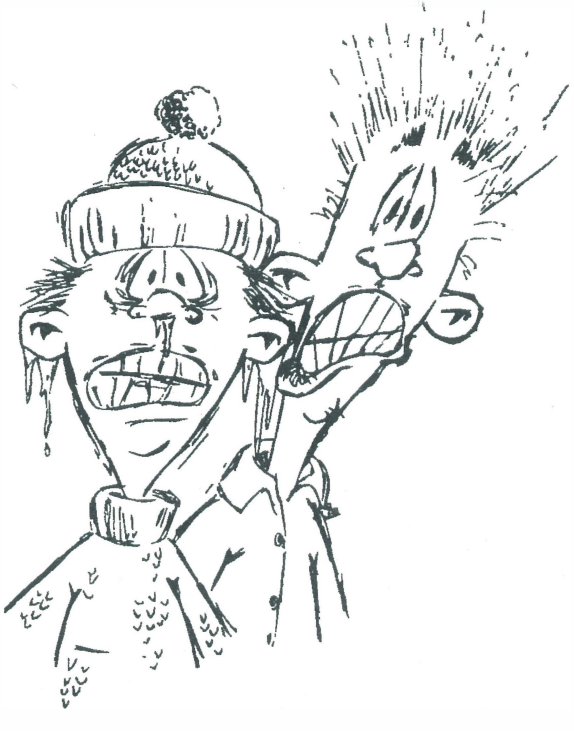
Note:

- Keep lid taped shut for waterproofness.
- Keep filled tin and blanket in a drawstring bag. You may want to line the drawstring bag with a large freezer bag,for added waterproofing.

The Seven Enemies of Survival

Pain, cold, thirst, hunger, fatigue, boredom, and loneliness–every one has experienced these, but few have known them to the extent that they have threatened survival. In the survival situation, the feelings of pain, cold, etc., are no different from those experienced elsewhere. They are only more severe and more dangerous. With these feelings, as with fear, the more you know about them and their effects on you, the better you will be able to control them, rather than letting them control you.

❶ *Fear*



Should you become lost or confused, your immediate problem is fear. Fear is a very normal reaction for anyone faced with an emergency. Fear influences your behaviour and your chances for survival.

There is no advantage in trying to avoid fear by denying the existence of danger. It is important to realize your fear should be accepted as a perfectly normal reaction rather than a shameful one. How you react to fear depends more on yourself than on the situation. Once fear and panic set in–pain, cold, thirst, hunger, fatigue, boredom and loneliness follow. These seven enemies of survival may attack alone or together. They are more dangerous than they seem and their effects should be known and met. Because these enemies are often ignored they tend to contribute to panic.

❷ *Pain*

Pain is Nature's way of making you pay attention to something that is wrong with you. But Nature also has ways of holding off pain if you are too busy doing something else to pay attention to the injury

right then. Pain may go unnoticed if your mind is occupied with plans for survival. On the other hand, once given in to, pain will weaken the drive to survive. Pain can get the best of you if you let it, even if it is not serious or prolonged. A special effort must be made to keep hopes up and to keep working.

❸ *Cold*

Cold is a much greater threat to survival than it sounds. It not only lowers your ability to think, but also lowers your will to do anything but get warm again. Cold is an insidious enemy, at the same time that it numbs the mind and the body, it numbs the will. Because it is hard to move and you want to sleep, you can forget your goal–to survive.

❹ *Thirst*

Thirst is another enemy of survival. Even when thirst is not extreme, it can dull your mind. As with pain and cold, thirst can be almost forgotten if the will to survive is strong enough. It is also important to remember not to deprive oneself unnecessarily of water. Serious dehydration may occur in a survival situation even when there is plenty of water.

❺ *Hunger*

Hunger is dangerous because of the effects it can have on the mind, because it affects a person's ability to think rationally. Both thirst and hunger increase a person's susceptibility to the weakening effects of cold, pain, and fear.

❻ *Fatigue*

Even a moderate amount of fatigue can reduce mental ability. Fatigue can make you careless–it becomes increasingly easy to adopt the feeling of just not caring. This is one of the biggest dangers in survival. The confused notion that fatigue and energy expenditure are directly related may be responsible for many deaths in survival situations. Certainly, there is a real danger of over-exertion, but fatigue may actually be due to hopelessness, lack of a goal, dissatisfaction, frustration , or boredom. Fatigue may represent an escape from a situation which has become too difficult. If you recognize the dangers of a situation, you can often summon the strength to go on.

❼ *Boredom and Loneliness*

Boredom and loneliness are two of the toughest enemies of survival. They are harmful because they are unexpected. When something is expected and nothing happens, and you must stay still, quiet and alone, these feelings can creep up on you.

What About Food?

Use Canada's Food Guide to plan cookout menus. Remember to pack and cache (hide) food carefully on woodstravel trips. When planning your menu, consider the type of trip you sre taking. For example, on a backpacking trip you would carry dreied fruit instead of fresh, boil in a bag meals instead of fresh meat.

Canada's Food Guide

A balanced menu includes food from each of the four main food groups. Each food group should be served 3 to 5 times daily.

Milk and milk products–3 to 4 times/day

Meat, fish, poultry or alternatives–3 times/day

Bread and cereals–3 to 5 times/day

Fruits and vegetables–4 to 5 times/day

Choosing the Right Foods

Nutrition

Good nutrition and high energy foods are especially important for people involved in strenuous physical activity. By planning your menu according to Canada's Food Guide, you'll get a good balance of these energy foods.

a) **Carbohydrates:** dried fruit, sweets, bread, cereals, bannock, pancakes.

b) **Protein:** milk, egg powders, cheese, meat, whole grains, legumes, nuts.

c) **Fats:** bacon, margarine, cheese, nuts; sausage, chocolate.

d) **Vitamins & Minerals:** whole grain & enriched cereals, eggs, meat, cheese, milk. Vitamin C: fruit juice mixes, e.g., Tang.

e) **Water & Salt:** Drink lots of water and liquids to prevent dehydration, fatigue, stomach cramps, etc. A little table salt is preferable to salt pills.

Taste and Texture

Use herbs and spices to spark up food. Vary the textures and provide contrasting flavours in a meal e.g., after a meal of macaroni, have a crunchy dessert such as apples and oatmeal cookies. Variety in taste and texture will make your meals more interesting and appetizing.

Preservation

Dehydrated and freeze dried fruits, vegetables and meats keep indefinitely in air-tight, moisture-proof packages. So do soup mixes, drinks, pudding and sauce mixes. Dry-smoked bacon, ham, beef and salami wrapped in vinegar-soaked jay-cloths and plastic-bagged will keep a minimum of two weeks.

Buy hard cheeses (cheddar, swiss, gouda, edam) in a vacuum-sealed plastic package or waxed rounds. Cereals, legumes and flours keep a long time if the package is air-tight and dampness proof. The same is true for egg and milk powders. Do not use soft margarines. For extra long trips try canned butter. Semi-sweet chocolate keeps much better than milk chocolate. Breads such as pita bread keep well and are almost crush-proof.

Crushability

Select dense, unsliced and/or tightly packaged breads, e.g. German rye, pumpernickel, bagels, rye-vita. Use oatmeal, cracked wheat, granola and "Red River" cereals. Carry powdered eggs or break eggs into a screw-top plastic jar and cover with a little oil and use as needed. Crackers, potato chips and cornflakes are nutritionally poor and will be pulverized in the confines of a backpack. Use bannock as a bread alternative.

Weight

Canned foods are heavy. Use them on weekend trips or when there is no other alternative and pack out the empty cans. Freeze dried foods are the lightest but can be expensive. Fresh fruit and vegetables are heavy because of the water content but some are worth bringing as a treat, e.g., carrots, onions, even celery.

Packaging

Soup and sauce mixes, juice crystals and some freeze-dried foods are already in airtight, waterproof packages and need not be re-packaged. Others such as cereals, pudding and cake mixes, sugar, etc., must be re-packaged in plastic bags and closed with twist ties (make sure twist ties are flat so ends do not puncture other plastic bags). Label each bag with the quantity and contents and enclose cooking directions where necessary (e.g., cake mixes). Leave canned goods in the can. Avoid glass or brittle plastic containers. Carry liquids in high-quality, non-porous plastic screw top bottles. Use gerry tubes for products such as peanut butter, then you can squeeze the product out rather than using a utensil for spreading. Pack plastic lunch boxes with individual containers for frequently used items such as sugar, tea and cocoa.

Caching Food and Equipment

Make sure you can recognize your cache (hide-a-way). It is important to hide food from would-be thieves. Here are some helpful hints.

Rodents: Wrap your cache in two or three layers of new plastic and place in an air-tight tin. Bury it deep at the base of a tree in mineral soil. Make a bear bag and suspend it from a tree to discourage bears.

Permananet Springs: This is a good place to keep canned foods.

Pack your food, supplies and equipment carefully. They can be damaged if they get wet, rust (canned foods) or freeze. Food caches can attract rodents and other wild animals, so pack and protect your food carefully.

It's Edible!

Wild Plants

Some Rules for Gathering

1) Gather plants only where you are legally permitted to do so. All plants within Provincial and National Parks and Reserves are protected by law. Anyone picking, damaging or transplanting any plants can be prosecuted. Some municipalities have regulations governing the gathering of plants, trees and shrubs in their jurisdictions. Some plants are protected by law (e.g., endangered species).

2) Plants should not be gathered where they serve the public in any way, such as along trails, nature walks or in school study areas.

3) Gather plants in places where the collecting activity, especially digging for roots, will not contribute to erosion or create any other problems.

4) Collect only what you can use. If you want the leaves, pick only those you can use, leaving the rest of the plant uninjured. When using the roots of perennials, be sparing and use small quantities. When collecting parts other than the root, leave the root intact.

5) Vigorous, introduced plants should be considered fairer game than less competitive native ones (Check with your local Fish and Wildlife, Forestry, Public Lands or Agriculture Department).

6) Disturb the surrounding plants as little as possible.

7) When you know the plant you have chosen to collect is abundant and thriving, you can collect it using these guidelines:

- Take the overcrowded plants.
- As a general rule: Take 1 in 5 if the plant is common, 1 in 10 if less common, and 1 in 20 if somewhat scarce in any given area.

8) There are places where plants may not be fit to eat. Plants near a well-travelled road may have a higher than normal lead content. Avoid collecting plants where the use of herbicides is suspected, such as along some municipal roads, railroad and power line rights-of-way, and near orchards.

Know your plants!

Be careful and cautious. Eat only plants you can identify. Although relatively rare, there are plants that can kill. Learning the scientific name of the plants you can use can be very important. A plant can have many common names and be confused with the wrong plant, especially if you travel in different parts of the country.

Eating Wild Plants

The taste of any wild plant is a new experience to most people. Some plants can be very bitter and others can be completely tasteless.

In comparison to garden vegetables, wild plants contain more nutrients gram for gram, mainly because they are of a much lower water content. You may find that eating less than half the quantity that you would normally eat of a garden vegetable may be enough to meet your needs.

Tasting some wild plants can cause sharp stomach pains in some people. Begin by eating a plant in small quantities until you are used to the taste. Gradually eat a little more of the plant at other meals. Talk to your parents and your JFW club leader **before** eating any wild plants.

*The following selection has been reprinted from **"Living With The Land, Uses of Plants by the Native People of Alberta"**, compiled by Joan Kerik, illustrations by Steven Fisher, August 1982, Courtesy of the Provincial Museum of Alberta.*

Common Bearberry or Kinnikinnick

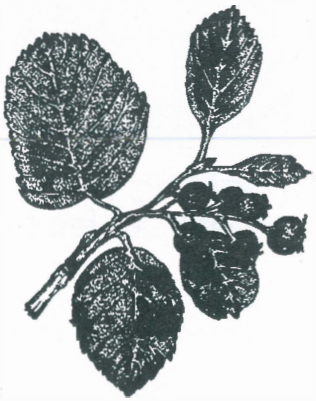
Arctostaphylos uva-ursi

The fruit is usually eaten or used to make necklaces. The leaves are used for tea.

Prairie Crocus or Pasque Flower

Anemone patens

Usually not eaten but is used for some medicinal purposes by Native people.



Saskatoon or Serviceberry

Amelanchier alnifolia

Berries are eaten fresh cooked or dried. Saskatoons are also used to make dye for craft projects.

Common Wild Rose

Rosa woodsii

Very common throughout most of Alberta. The rose hips (fruit) are eaten after removing the seeds. In winter the dried fruit still on trees are often used as "famine" food.

Wild Strawberry

Fragaria virginiana

The fruit is commonly eaten fresh and uncooked.

Fire Lighting Skills

Always practise fire-lighting skills under the supervision of your leader.

Fires and campfires are an important part of woodstravel for just about everyone. Here's what two people had to say about what fires mean to them.

"What is a camp without an evening campfire? It's nothing but a place in the woods where some people have some things."

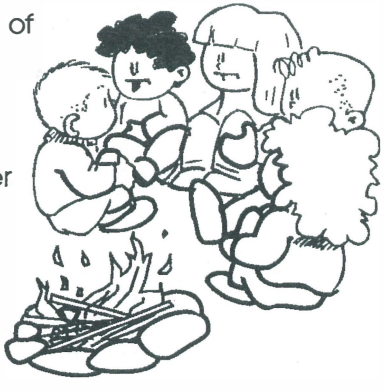
—Ernest Thompson Seton

"The Navajo has a different idea of comfort from ours, but according to his likes he can make himself and his companions comfortable with very little. One thing always included in the "very little" is fire. If one is wet or cold, he needs a fire; if the weather is balmy and fair, he needs a fire to cook his humble meal. Perhaps the conditions are pleasant, the wind is warm and he has no food; then especially he needs a fire for company."

–From Weaving a Navajo Blanket by Gladys A. Reichard

Fire for Warmth and for Cooking

Building a fire and keeping it going is one of the most important woodstravel skills you can learn.



Choosing your campfire site

The first step in building a fire is to consider how you are going to put it out. A fire on a poorly chosen site can take a lot more effort to put out and could get out of control.

Find a site where a fire has been built before or find a campfire area. If none are available, check with your club leader and find a place where a fire can be safely lit. It could be on a sand or gravel bar, or in the woods. Make sure you remove all the "duff" (leaves, roots, etc.) and build your fire on mineral soil. Keep some grass or carry grass seed in your pack. Replant and water it once your fire is completely put out.

Twig method of fire lighting

Gathering Twigs **Tying** **Lighting**

Gather a large handful of twigs that are no thicker than a match stick.

Gently lay the twig bundle down in your fire pit. Now add more wood in this order:

10 finger-thick sticks
2 wrist-thick sticks
2 leg-thick sticks
Light the fire. Keep your fire burning by adding more sticks.

Using a twig bundle when it's wet outside

Add very dry things to your twig bundle. Here are some ideas:

- twigs • inner bark of black poplar
- grasses • dry grass
- dry pine needles
- old man's beard (a form of lichen)
- birch bark
- feathersticks (learn how to make these!)

In cold or wet weather, use a pile of wrist-thick sticks that is as high as your knee.

Featherstick

Matches

Always carry matches in a protective container in the following three places: **(a)** in your pant's pocket, **(b)** in your coat, and **(c)** in your pack. Matches should never be carried loose in any pocket. Keep your matches in waterproof containers that can be easily opened when your hands are numb.

You can test how cold your hands are by touching the thumb to the little finger of the same hand. As soon as you cannot do this or have no feeling in your fingers, tell your leader or an adult and immediately start trying to warm up.

ALWAYS ASK AN ADULT FOR PERMISSION BEFORE LIGHTING A MATCH!!

Practice lighting a match. Practice in warm, cold, rainy, and snowy weather. Practice using wooden and paper matches.

Flint and Steel

How to properly use your flint and steel:

Pull the blade from the slot. You will notice that one edge has squared off teeth—this edge is used to make tinder and strike the spark.

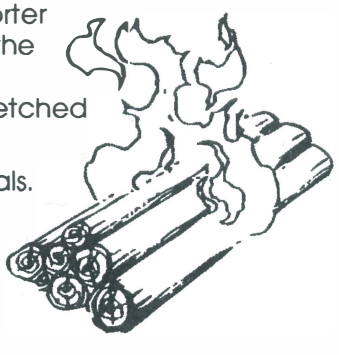
Absorbent cotton is an ideal tinder, but almost any inflammable material that can be scraped to make a fuzzy nest can be lit. Try blotting paper, cardboard, cotton cloth and wood. Scrape up enough tinder to cover a quarter, then hold the flint so that the sparking metal is pointed into the nest of tinder. With the "teeth" edge of the blade, strike a shower of sparks into the tinder. A couple of scrapes may be needed to remove the protective coating on the "flint". When the tinder flames, light your paper or fuzz sticks.

Ways to Build Fires

The Parallel Firelay

Most of the sticks in this fire are parallel to each other. They are in line with the wind. For a smaller fire, use shorter sticks. Longer sticks are usually used in the winter. The length of the sticks can be from fingertip to fingertip of your outstretched arms.

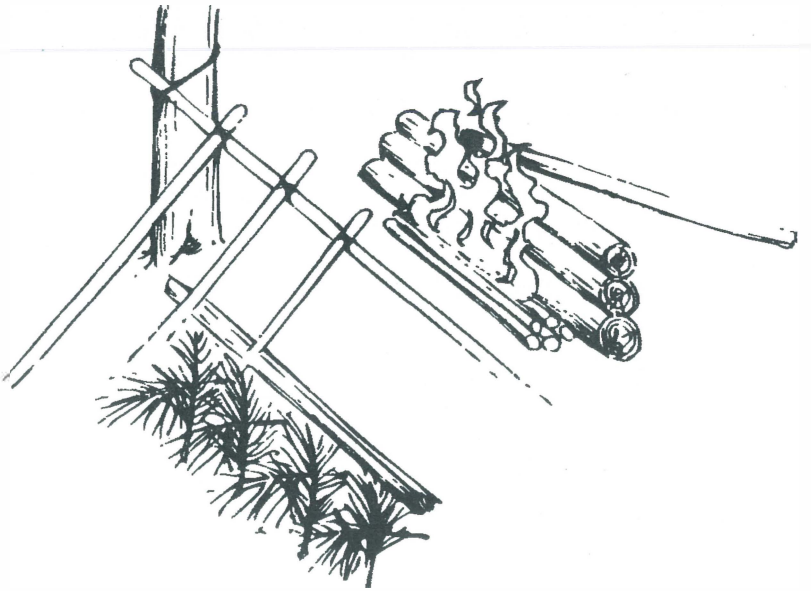
You can use this firelay for cooking meals.



Fires are like people. They thrive on attention.

- Always check your fire.
- Keep the wood close enough together to burn or add more wood.
- Keep it small and controlled at all times.

The Re-emitter Fire



Build a log wall parallel to the wind. The wind must blow across the front of the wall to carry away the smoke and sparks. This log wall will re-direct the fire's heat and light back toward you.

If it is not very cold, build the log wall out of green logs so that it lasts longer. If the weather is very cold, use dry logs. These logs can become fuel as the fire burns.

The log wall should be as high as your waist. The logs should be as long as the distance from fingertip to fingertip of your outstretched arms.

The wall is usually built vertically. You can also build it so it leans slightly toward the fire. If it collapses, it will then become fuel for your fire.

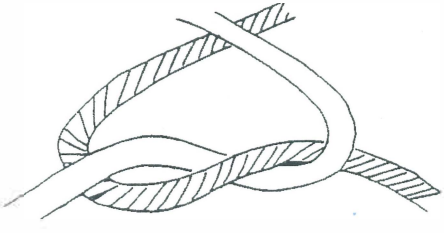
Build the fire against the face of the log-wall so you will get the most amount of heat and light possible.

Knots and Lashings

Knots, Lashings and Rope Care

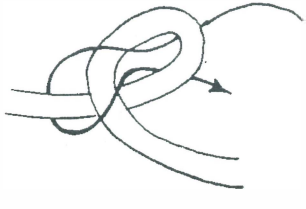
Practice knots so you can tie them quickly under the worst conditions, such as at night in freezing rain or snow. **Note:** *Bight:* the loop or coil of a rope, i.e. to fasten with a bight (bend). *Frap:* to bind tightly.

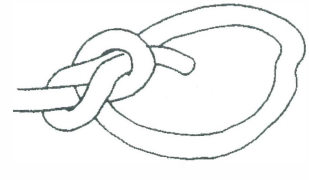
Reef Knot or Square Knot



This is a standard method of tying two ropes of approximately the same diameter together. Tie using the ends of the ropes-left over right, under and through, right over left, under and through. Do not confuse the reef knot with a granny knot. Practical use: tying the ends of bandages in first aid.

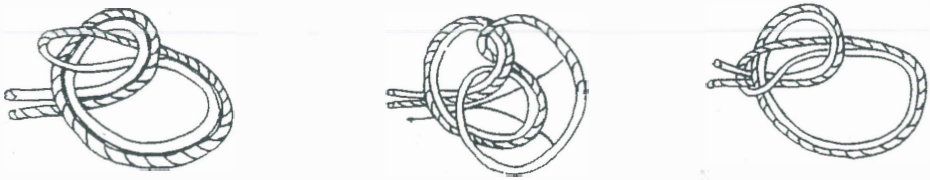
Standard Bowline - one loop





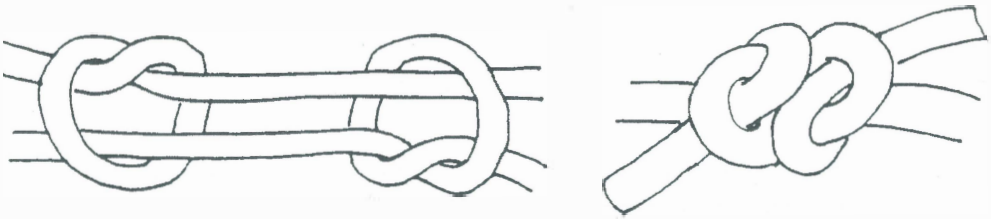
This is a standard fixed loop. Learn to tie it around your waist as well. Make an overhand loop in the standing part of the rope. The end of the rope goes up through the loop, round the back of the standing rope and back through the loop. Practical use: securing the bow of a canoe to a dock.

Bowline on the Bight - two loops



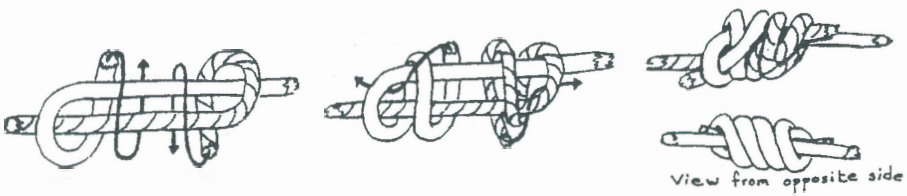
This is a standard bowline tied with a bight of rope. Make the overhand loop (as for the standard bowline) and take the bight (which forms the end of the rope) through the loop. Pull the bight down to the end of the large loop thus formed, separate it and put it over the large loop. Slide the running end up so that it finishes around the standing rope. Practical use: lowering a pack from a tree or other high place.

Single Fisherman's Knot



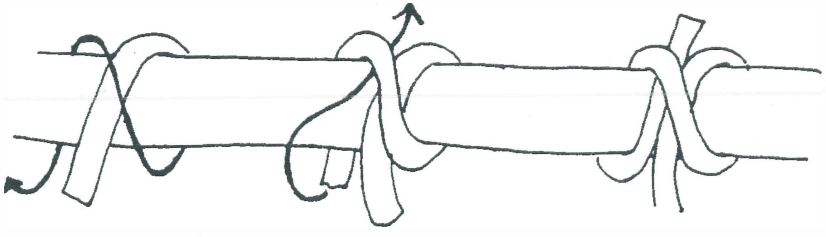
This is an exceptionally strong knot and one of the few that needs no safety overhands. Tie the end of each rope separately in an overhand knot around the opposite rope, and then pull them together. Practical uses: for tying ropes into loops, repairing fishing line.

Double Fisherman's



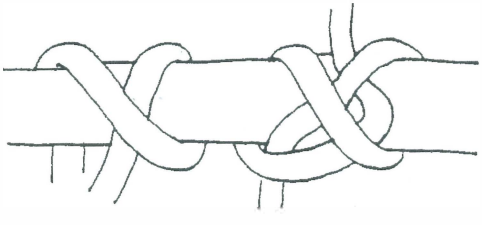
This knot is tied similarly to the single fisherman's, but with an extra turn (towards the inside of the knot) in each of the overhands. It is highly recommended for tying rope slings, etc., since it needs no safety overhands and is exceptionally strong.

Clove Hitch



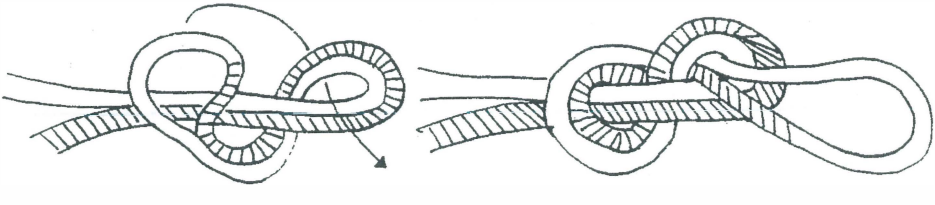
This is the strongest hitch. Make a loop around the object with the running end on top of the standing part. Make another loop beside it and tuck the end under the standing part between the two loops. Practical uses: an anchor knot around a tree, tying a guy-line to a stake or tying bunches of cloves (spices) together (original use).

Constrictor Knot



This knot is more secure than the clove hitch but is a bit harder to tie and to untie (especially when wet), so the clove hitch is still the best choice under most conditions. Practical uses: a temporary whipping, a tension knot for holding tent poles together, or for starting parallel lashings.

Double Figure of Eight Loop or Figure Eight on a Bight



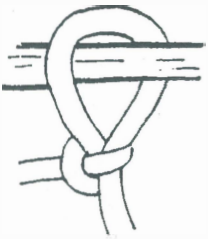
This is an extremely strong fixed loop and mechanically stronger than the bowline. Make a bight in the end of the rope. Start as if tying a simple overhand loop and make an extra half twist around the standing loop. Push the end of the bight through the loop. The knot may also be single tied. Practical uses: very secure waist attachment for mountaineering purposes or for clipping into a climbing harness.

Sheet Bend

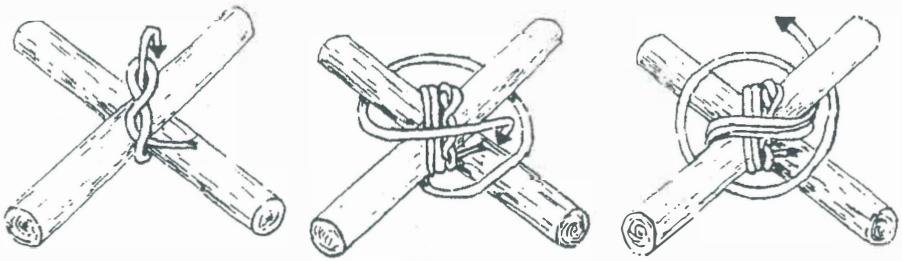
The sheet bend is used to tie a small-diameter rope to a larger one. Make a bight in the large rope. Run the small rope up through the bight and take it around the bight. Tuck the end of the smaller diameter rope under its own standing part, staying on top to the larger rope's bight. Practical use: connecting a large rope to a hauling line, e.g., in a river crossing.

Slip Knot

This is a standard running loop. Make a loop in the running end. Pass a bight of the standing part through the loop. The bight then forms the loop of the knot. To untie, pull the standing part. Practical use: for tying rope around logs when putting up plastic lean-to's.

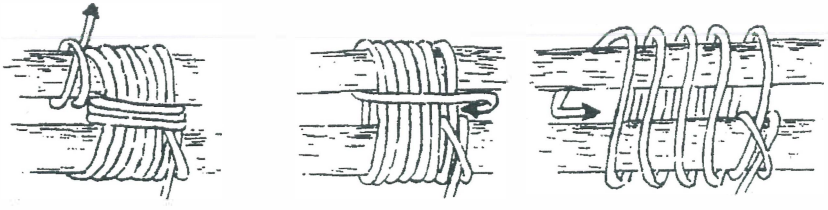


Square Lashings



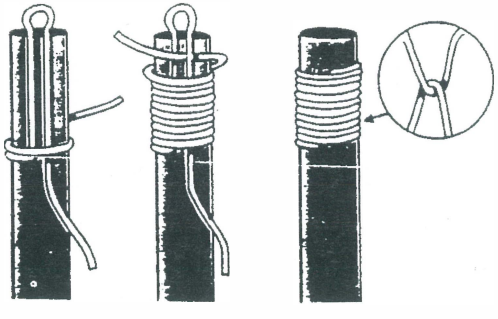
The knot is named a square lashing because the rope is wrapped at right angles to the wood, making a square. Start on the leg with a clove hitch. Wrap under the leg and over the cross-piece. Wrap three times. Frap three times. Finish on the leg opposite the starting hitch with the clove hitch. Practical use: to join any two pieces of wood at right angles to each other.

Shear Lashing



This is a flexible lashing for two shear-poles. Start with the shear legs together and parallel. Tie a clove hitch around one of the legs. Wrap loosely seven times, with about three or four times the rope's diameter distance between the poles. Frap tightly between the shear legs three times. End with a clove hitch on the other leg. Practical uses: bridge building, constructing A-frame tent poles and for trestles.

Whipping



A whipping is generally made with much smaller diameter rope than that which is to be whipped. Make a loop of rope along the length of the main rope. Take a turn across the whipping rope itself and start winding the rope towards the loop. The length of the whipping is usually approximately the same as the diameter of the main rope. At the loop, push the end of the whipping rope through tightly and pull the loop through the whipping, using the other end, to about halfway through. Cut the ends flush or tie them together on the outside with a reef knot. Practical use: for preventing the ends of a rope from fraying.

Rope Care

There are two types of rope.

- those made with plant fibres–hemp, sisal, manila, jute, flax, cotton.
- those made with man-made fibres–nylon, perlon, polypropylene.

Plant fibres are susceptible to fungus and mildew. It is important not to leave these ropes wet or lying on wet ground overnight because they may rot. Wetness does not affect man-made ropes to the same extent; however, no rope should be left wet. Man-made ropes are less resistant to direct sunlight and heat.

Both types of ropes are stressed when abraded or subjected to chemicals like stove fuels. Extremely heavy loads may also stress ropes.

Ropes associated with personal safety, like climbing ropes, should have a log book detailing their use. Ropes like these have a life-span based on falls and fall factors, and are discarded after a period of time. Check with the manufacturer to determine the rope's suggested life-span.

Do's and Dont's in rope care...

- Do not leave ropes wet for long periods of time.
- Dry ropes by hanging them loosely in a shaded, well-ventilated, dry area.
- Check the rope for sand, grit or other abrasive materials frequently.
- Whip the ends, or wrap them to prevent fraying.
- Keep ropes neatly coiled and identified as to quality by colour coding the ends of the rope.
- Never stand on ropes, especially climbing ropes on which your life may depend.
  Never attempt climbing without a qualified instructor.
- Discard a rope if it looks worn out.
- A new rope will be stiff and hard to handle (especially nylon), and there will be kinking problems at first. Coiling over a distance or over a steep drop will help to reduce the tangling.
- Avoid passing ropes under tension, such as over sharp edges or rocks.
- Protect the ropes (and trees) with burlap sacking (i.e., shelter building).
- Do not dry ropes by the campfire.
- Never lend or borrow ropes that are used for climbing purposes.
- Inspect ropes thoroughly and frequently.
- If there is any doubt about the quality of a rope, it should be discarded.

Shelters

Emergency Shelters

Sometimes you can find a ready-made shelter, such as an overhanging tree or a cave, that you can use in an emergency. Here are four types of shelters you can look for:

1. Tree Den

A very large conifer with branches hanging down to the ground can form a natural shelter. The bed of needles can be comfortable to sleep on and you will stay dry if it rains. Enter on the lee side of the tree away from the prevailing wind.

2. An Uprooted Tree

An uprooted tree can protect you from the wind, and provide a base to which a plastic tarp can be attached. The branches and roots may make a good roof.

3. Winter Tree Hollow

When there is snow on the ground, the area surrounding trunks of conifer trees is often hollowed out, creating a shelter. This usually happens when the snow falls with no wind. Compare the temperature of your shelter with the outside air.

4. Cave

Caves can be found under an overhanging cliff or bank, or on steep slopes with large rocks in rocky or mountainous areas. Try to choose a cave that faces the sun for most of the day (south or west-facing). Pick the smallest one you can comfortably use, because your body heat will keep you warmer in a small space. Wet caves will be cold at night—avoid them. Be aware that caves are sometimes used by hibernating animals or are snake hibernaculas–Use Caution before entering a cave.

If these are not available for you to use, here is a quick, easy shelter you can build.

Plastic Tarps

You can keep a group warm by using a plastic tarp to form a tent-like bubble over you. This shelter can keep you warm and dry through a short rainstorm.

Snow Shelters

In snow, you can quickly build a quinze or a fast snow cave.

Quinze

This simple snow shelter is valuable because it can be made out of virtually any kind of snow–from light mountain powder to wind-slab.

The theory behind building a quinze is simple. Undisturbed snow on the ground forms layers with each new snowfall. Each layer reflects the temperature within the snowpack and the conditions at the time the snow originally fell. When this snowpack is disturbed or mixed, and compacted recrystallization occurs the resulting pile of snow is hardened.

Once a pile of disturbed snow has been allowed to reconsolidate, it can be hollowed out to make a shelter.

How to make a Quinze

1. Using shovels, pots, pans or anything else that might work, clear a circle 2-3 metres in diameter down to the ground (in shallow snow) or to a hard snow layer.

2. Shovel the snow back into the circle along with all the other available loose snow, forming a huge pile. Make sure that the snow gets mixed thoroughly.

Break all slabs or blocks to a fine powder and avoid any icy crust layers.

Stamp on the pile occasionally to mix and compact the snow.

Make sure the pile is dome-shaped with no flat spots.

3. Stick branches, ski poles or glacier wands into the pile (about 1/3 metre deep) at regular intervals.

4. Allow 1 to 3 hours for the snow to consolidate.

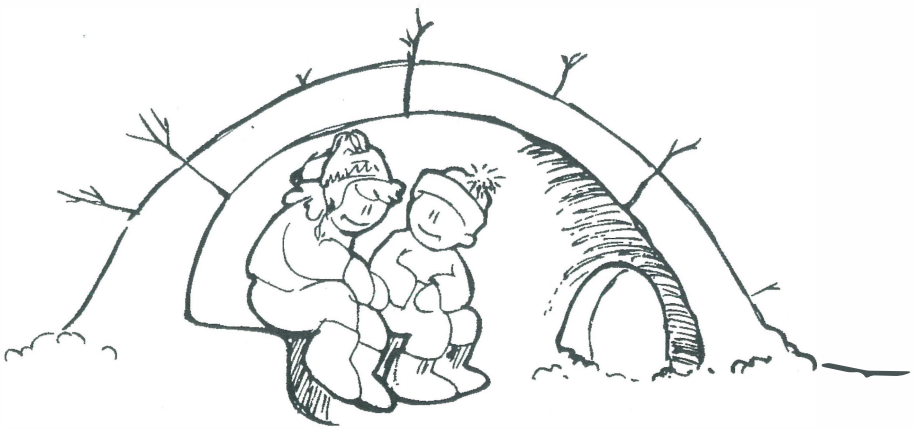
5. Cut a low entrance tunnel on the side away from the prevailing wind and excavate the inside to form a dome-shaped room.

Use the sticks or poles that you placed in the pile as guides to tell you when you're getting close to the limit of the wall.

6. When the structure is almost hollowed out, use the remaining snow from the ceiling to build up the height of the floor for a sleeping platform (see illustration).

7. Smooth the walls to prevent drip points.

8. Light a candle inside and allow its heat to help consolidate the walls and floor.



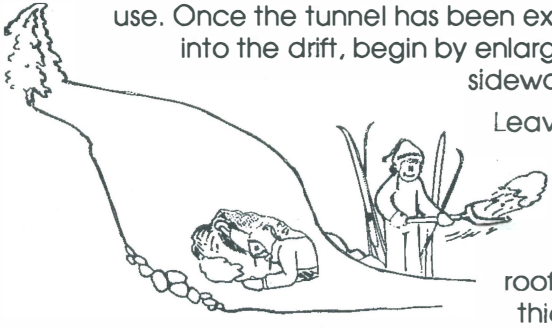
Fast Snow Cave

Trying to excavate a snow cave out of a drift through a small, low entrance tunnel is frustrating, wet, cold work. If you start with a large entrance that you can later close in, you will be able to work faster and stay drier.

Drifts can be found on the lee sides of wind-exposed ridges, rocks and low clumps of trees or shrubs.

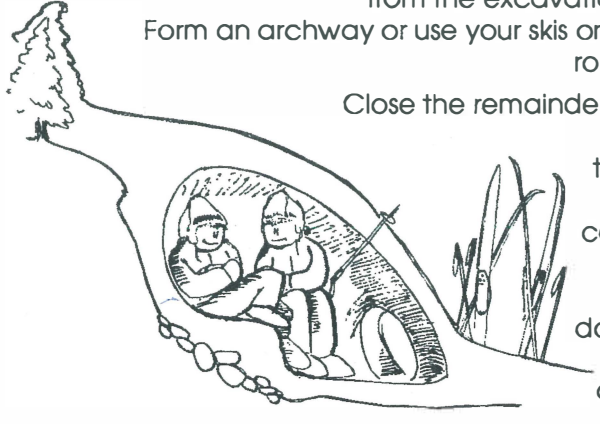
Begin your construction by digging a tall, wide tunnel (up to 2 metres x 1 metre) at the base of the drift.

If possible, use a snow saw to cut some large blocks (1 metre x .5 metres x .2 metres) out of this tunnel. Save these blocks for later use. Once the tunnel has been excavated more than a metre into the drift, begin by enlarging the room by digging up, sideways and deeper into the drift.



Leave a sleeping platform about 1 metre up from the floor of the entrance. Ensure that the inside of the cave is dome shaped and that the roof and walls are at least 1 foot thick (.3 metres). Flat-roofed or thin-walled snow caves always sag and eventually collapse. Make sure the walls are smooth.

Use your ski pole to make an air vent in the roof of your cave. Then start to close the large entrance tunnel using the blocks you saved from the excavation of the initial entrance. Form an archway or use your skis or a board to create a low roof to your entrance-way.



Close the remainder of the entrance-way by fitting blocks of snow together and by chinking the small holes. The completed snow cave will then have a raised sleeping platform, a dome-shaped room and a low entrance tunnel ... and you will be quite dry!

Tents

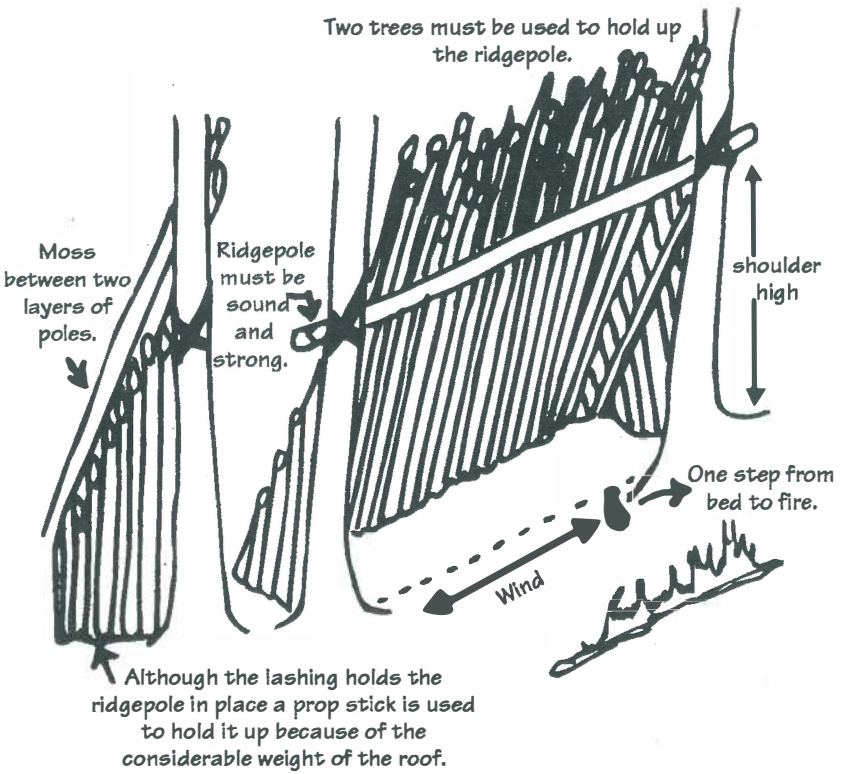
Each tent is set-up slightly different. Follow the instructions that came with the tent. Practice putting it up until you can put it up as a team with all but one person blindfolded ... then you know you can put up your tent at night. Wrap the lines with florescent tape so you won't trip on them at night.

Basic Survival Lean-To's

A good shelter will deflect the wind, fend off rain or snow and if necessary trap the fire's heat to provide a warm, dry area to work, rest, play and sleep in. Shelters can be built above the ground, on the ground, partially in the ground, or completely in the ground.

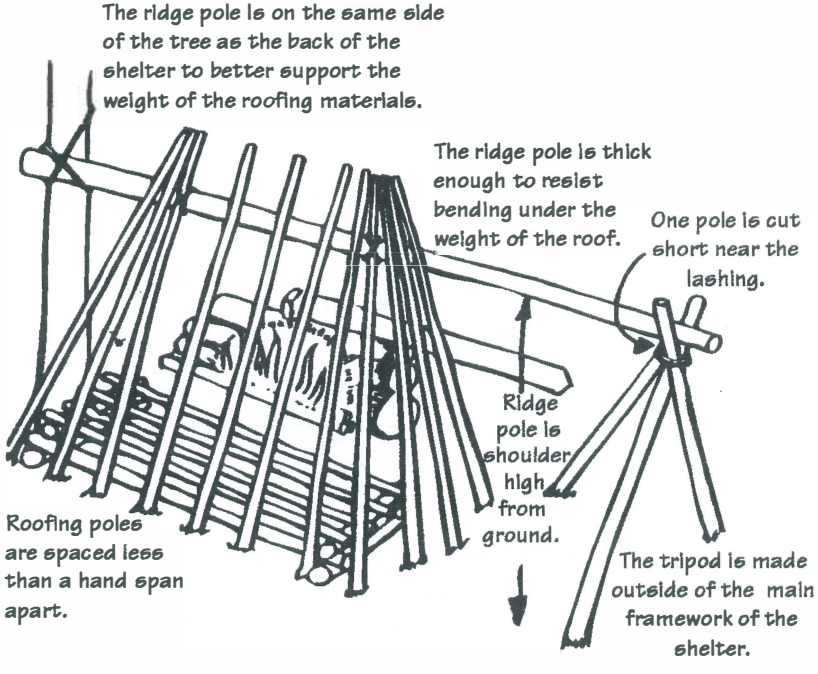
Open Fronted Lean-to Principles

You can usually find a good lean-to site at the base of tall spruce with large overhanging boughs. The ground near the base of the spruce is often spongy, drier in rain, or freer of snow in the winter. Place spruce boughs over the poles in an emergency, otherwise use plastic or tarps.



The Simple Open-fronted Lean-to

This lean-to with a fire is a favorite shelter. The lean-to and the fire are built parallel to the wind. Think about the weather when you decide how close to build the shelter to the fire. The ridge pole of the shelter is placed about one small pace from the face of the reflector fire when it is very cold, a long pace in moderately cold weather, and two steps away when the temperature is above zero degrees Celsius.

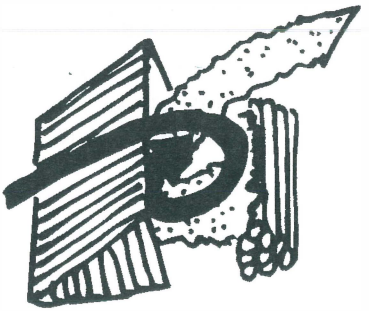


How wind direction affects the shelter

You can easily control your comfort from irritating smoke by building your shelter and fire properly. As you can see by the illustrations on the following page, wind direction will affect the smoke coming into your shelter.

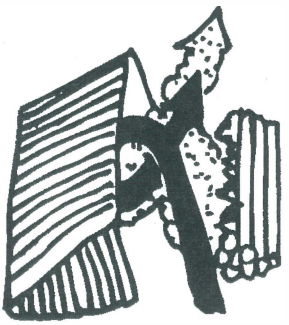
Intolerable

If the back of the shelter is oriented to the wind, the eddy action fills the shelter with smoke.



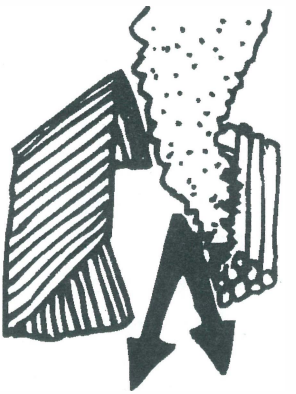
The Worst

A wind blowing directly from the front fills the shelter with smoke.



Barely Tolerable

Some smoke is carried into the shelter if the wind catches an end. It may be better to eliminate the lee end of the shelter.



The Best Arrangement

The wind is close to parallel to the ridgepole.

Campsite Selection

Select a campsite very carefuly. Here are some questions to ask:

- Where is the water supply for drinking, cooking and washing?
- Is there enough wood for fires?
- Is there a permanent campsite that we can use?
- Are there level sleeping areas?
- Is the site protected from wind and storms?
- Is the site off the trail?
- Where can food safely be stored?
- Where can the toilet be placed?
- Where will we cook?
- Is this site safe from hazards such as falling trees and avalanches?

Compass and Map Use

A map is a bird's eye view of the land. A map will tell you where you are and direct you to where you want to go. In ancient times navigators travelled the world by drawing maps of newly discovered lands to guide the people who followed them.

The Map

Maps show us an area's features, such as forests, lakes, rivers, roads and bridges. They give us a great deal of information in a compact form that we can use to plan a variety of trips.

Types of Maps

You can use many types of maps. Some types are:

- Road maps
- Forest cover maps
- Orienteering maps
- Topographic maps
- Aerial photographs

Always pick the type of map that gives you the information you will need for the trip you are planning.

How to look after your map

- Use as few folds as possible.
- Re-fold along the original fold lines.
- Wet maps tear and attract dirt. Dry a wet map as soon as possible.
- Keep your hands clean when using your map.
- Store your map in a plastic bag in your daypack.

How to orient you to your map

Look at your map by turning it so that the rivers, hills and valleys around you are lined up with how they are drawn on your map. Lines that are straight ahead of you on the map should be straight ahead of you on the ground.

Orienting a map means turning it so that true North on the map coincides with true North on the compass. The following two techniques will line up the map with true North.

1. If your position is known pick a prominent feature and draw a line from your position to the feature on the map. Turn the map until this line points to the distant object.
2. Choose a prominent lengthy feature such as a trail, river, etc., and turn the map until this feature parallels it.

If the map is always oriented, it will be less confusing. You will always be more certain of your position and you will know in advance whether to go right or left. You will quickly realize that as you turn, your map turns as well.

If you always keep the map oriented you will "see" with your map more of the surrounding area than you can actually see with your eyes at any given moment. You will know exactly where to look for a feature even though you cannot actually see it.

How to keep track of the distance you travel

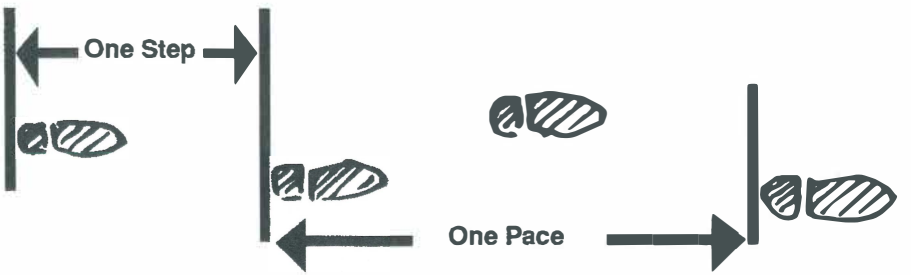
Experiment with how many paces you walk in 25 metres, 100 metres and 1 kilometre.

25 metres = _____ paces

100 metres = _____ paces

1 kilometre = _____ paces

Complete the chart on the next page to discover what your average pace is under different travelling conditions.



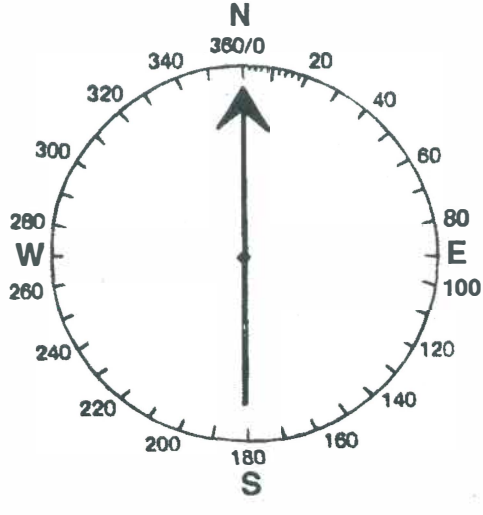
Method of travel	Terrain	KM pr. hr.	Min. pr. KM
Fast walking	Road		
Comfortable walk	Cutline		
Comfortable Walk	Meadow		
Comfortable Walk	Forest		
Snowshoeing	Average snow		
Skiing	Average snow		
Jogging	Trail		
Jogging 50 paces Walking 50 paces	Trail		

The Compass

Inside of every compass is a tiny magnet called the compass needle. This needle swings freely as it is influenced by the earth's magnetic field. The needle always points towards the direction of the center of the magnetic attraction. This direction is Magnetic North.

There are 360 degrees marked on a compass. 0 degrees is north, 90 degrees points to east, 180 degrees points south and 270 degrees points to west.

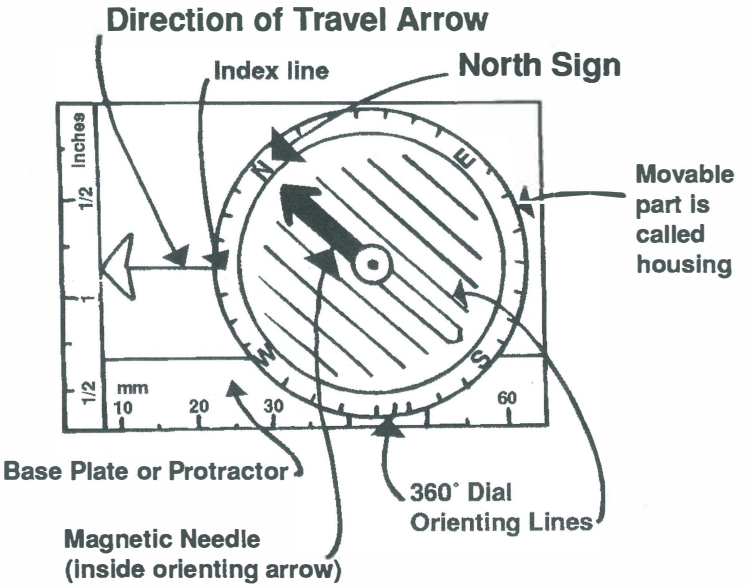
Degrees are used to describe an exact direction. The direction is called a bearing. A bearing of 180 degrees means the exact direction of 180 degrees from where north is. This is south.



Parts of a Compass

The compass has three main parts.

1. Compass Needle: When the compass is held level and the needle is allowed to move freely it will eventually come to rest on Magnetic North. This is called the bearing or declination. The red end of the needle should always point to Magnetic North. All compass needles point to Magnetic North, however maps show Grid North (see page 95).
2. Compass Housing: This is the part of the dial with the degrees marked on the outside ring showing the housing lines and housing arrow.
3. Base Plate: This is the bottom of the compass with the direction arrow.



How to use a Protractor Type Compass and a Topographical Map

1. Determine the bearing (declination) of Magnetic North for the map you are using. It should be indicated on your map.

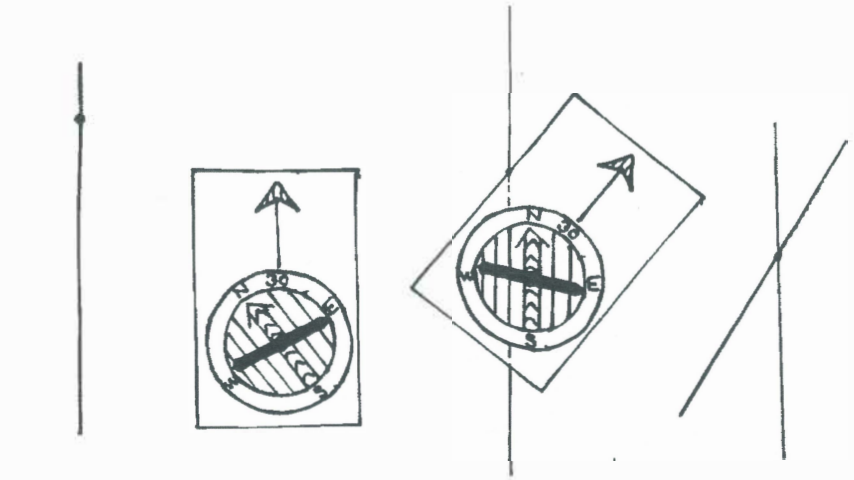
2. Draw a line from where you are (A) to where you are going (B). Show the direction with a small arrow head ➔ .

3. Place the compass edge (or any line on the base plate) along the line A-B. Make sure the direction arrow on the compass points in the desired direction of travel.
4. Rotate the housing dial until the orienting lines are parallel to the north-south lines shown on the map and the housing arrow pointing to the north of the map. Your compass is now set to point the right way.
5. Hold the compass level in front of you at waist height (be sure to keep the compass away from any metal such as zippers as this will interfere with the reading). While holding teh compass, position your elbows against your waist and turn your body until the red end of the compass needle points to Magnetic North. For most of Alberta this is 22 degrees. Raise your head and look straight ahead to a landmark on your route of travel. Walk to the landmark. When the landmark is reached repeat this step until you reach your final destination.
6. Repeat steps 2 to 5 for other legs of your course.

Using Your Compass as a Protractor

First, make sure you have a protractor style compass, then follow these steps.

1. Draw or choose a line on which you can draw an angle. Draw a dot at the tip of the angle.
2. Set the desired degrees on the direction arrow.
3. Holding the edge of the compass across the line and at the dot, line up one of the housing lines with the line in Step 1.
4. Draw a line along the compass edge and through the dot.



Step 1 **Step 2** **Step 3** **Step 4**

Orienting Your Compass for Grid North

1. Determine the location of Declination (Magnetic North-South line).
2. Holding the compass level, move it so that the north end of the needle points to the declination.
3. The compass is now oriented for Grid North.

Orienting the Map with the Compass

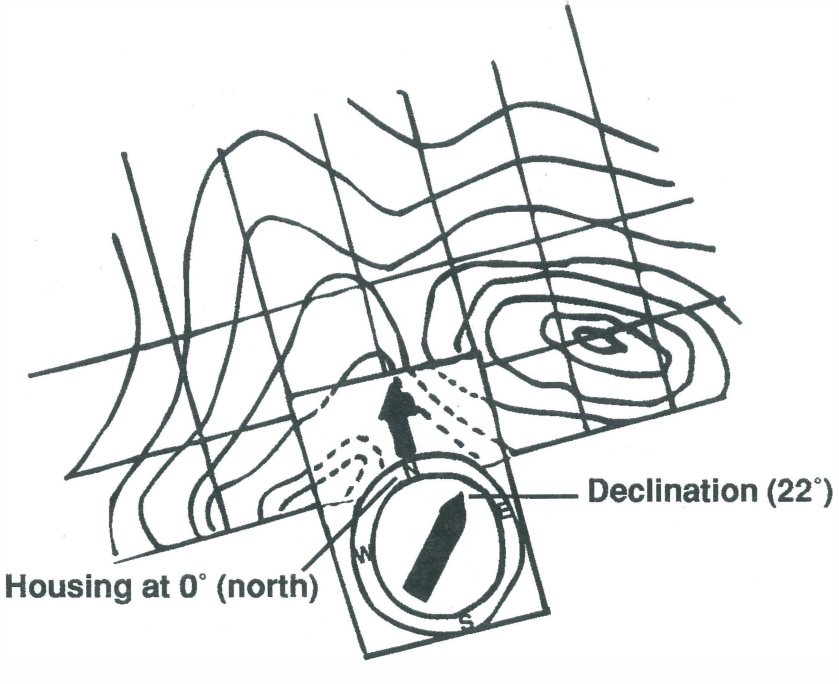
Method A

Place the map flat with the compass on top of it. Line up the straight edge of the compass with the vertical grid lines on the map. The direction of travel arrow should point to the top of the map. North is always at the top of the map.

Orient the map with a compass

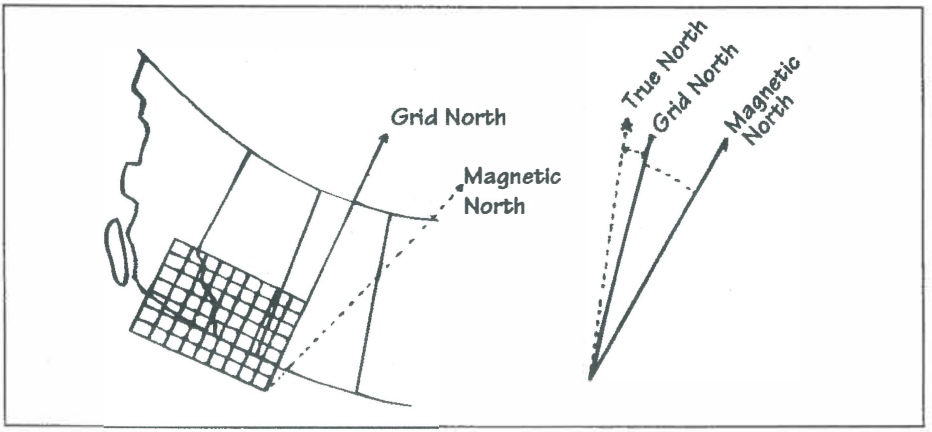
- Set the compass housing at 0 degrees (North).
- Turn the compass so that the N end of the needle points to the declination (Magnetic North-South line).

The compass must be lined up with Grid North, in order for your map to be oriented.



Method B

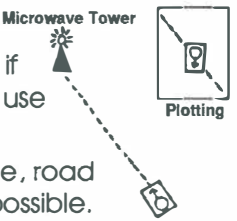
1. With a pencil, lightly draw the declination (Magnetic N-S line) on the area of the map you are using.
2. Place the compass on the map and rotate the map until the compass needle matches the declination line. Be aware of a 180 degree error if the north of the map and the north of the compass do not match.



Maintaining a Line of March

1. Take a bearing on a distant object that is in the direction you wish to travel. Select a tree, or another easily spotted object.
2. Travel to that object and then go back to Step 1.
3. If you are in dense bush or in featureless country the compass may have to be used by itself. Check your route often.

Taking a Bearing



When you wish to check a cutline, road, etc., to see if it has the same bearing as a given line on your map use these steps:

1. Point the direction arrow straight down the cutline, road etc., holding the compass straight out as far as possible. Make sure you are still able to see the dial so you can set the needle on the declination.
2. Hold your compass level. Rotate the compass housing until the north end of the needle points to the local declination.
3. Place the compass on your map. Make sure the direction arrow is lined up with the line being checked. Match the housing lines with nearby grid lines. The housing arrow should point to Grid North.

Activities

Spy Game

This game is similar to I Spy, except that you will use a compass.
You will need one compass to play this game.
Find a partner.
One of you will look for a nearby object and describe the colour and the degrees (bearing) of the object to your partner. Using the compass your partner locates the object you described. Continue playing until you have both had a few turns.

Design a Map

Imagine that a new child just moved to your neighbourhood. Today was his/her first day in school. To help the new child, draw a map of the classroom to show where to find things in the room.

Knife Safety

Always use your knife under adult supervision.

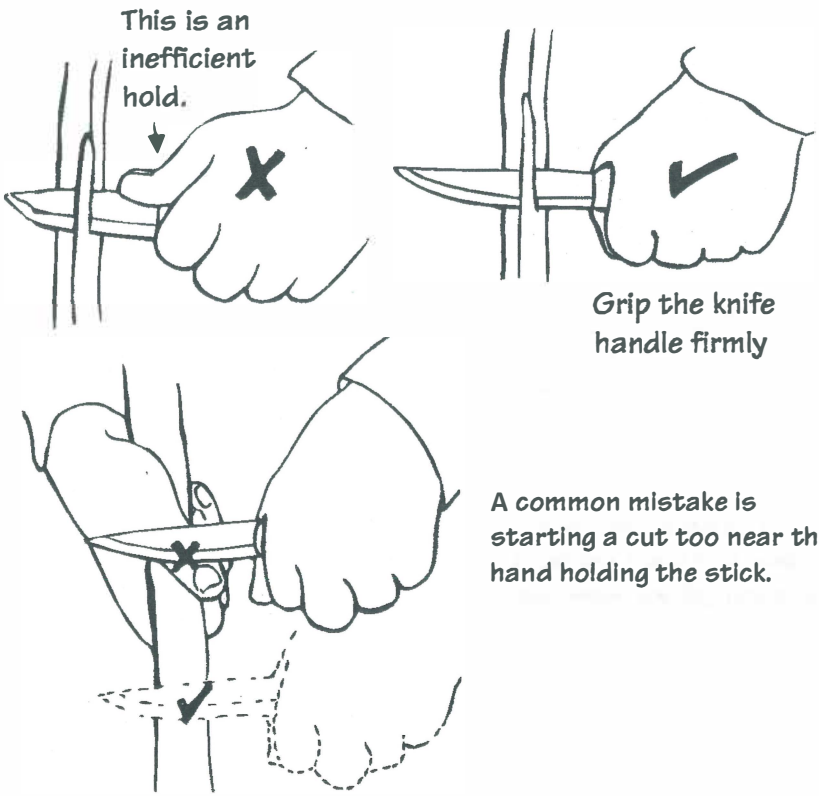
Once you learn how to use your knife, it will be your most useful tool for JFW projects and campouts.

Using your knife safely

Peeling a stick is a basic technique that leads to skillful wood carving. Peeled sticks dry out quickly and become lighter and tougher than unpeeled sticks. Heavy knots and branches should be trimmed off first.

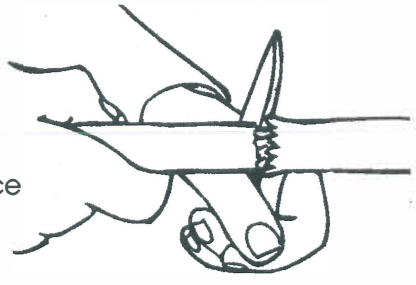
Peeling a stick with a knife

Wrap fingers firmly around the handle and make strokes away from your body.

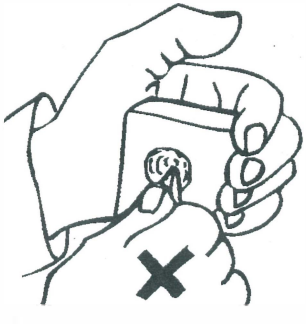


Cutting through a stick

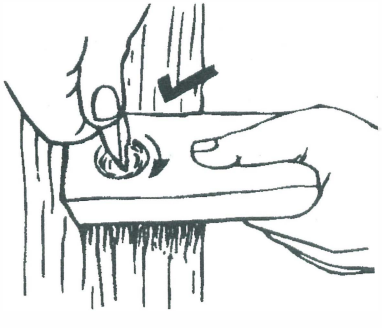
Make a series of small cuts all around the stick. (For a large stick this may need to be repeated a number of times.) Each time around, the blade can cut a little deeper. Once the cut is deep enough, the stick can be broken. The ends are then trimmed to complete the cut.



Using a log for support



It is dangerous to hold the wood in the palm of your hand when carving.



It is much safer to support your work on a log or the ground.

First Aid for Knife Cuts

The more you learn about using a knife, the less likely you are to cut yourself.

The most common cuts occur on the thumb and forefinger of the hand holding the wood. Areas where painful blisters are likely to form is on the palm below the baby finger and at the junction of the thumb and forefinger. A common site for stab wounds is on the palm of the hand holding the work in the palm (see illustration above).

Keep your hands and knife clean. Always have a first aid kit nearby that includes Steri-strips, non-stick dressing and antibiotic ointment. The faster you close the wound or cover it and exclude oxygen, the less pain and the quicker it should heal.

Stop bleeding immediately on any cut by applying pressure and elevating the wounded part.

How to Sharpen Your Knife

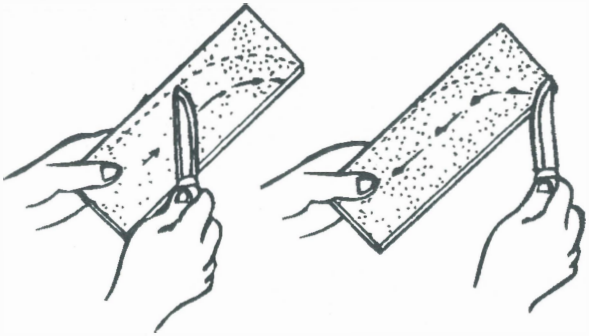
An adult must always be with you when you are sharpening a knife. Take care not to cut yourself. If you do, tell your Leader immediately.

How to make a sharpening board:

Method of Sharpening:

Use a curved motion to sharpen the curved part of the blade.

Each stroke ends or begins with an arc to sharpen the curved portion of the blade.

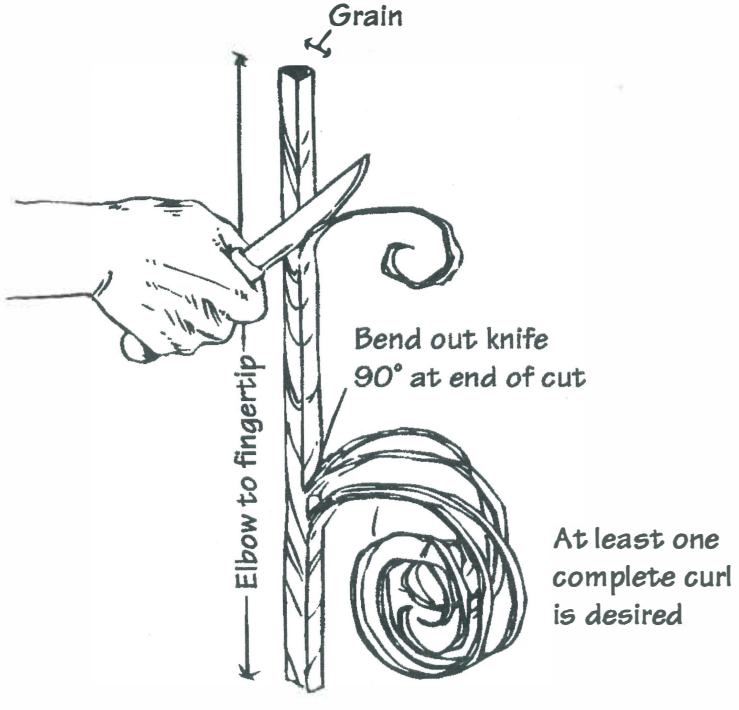


The entire bevel face should come in contact with the abrasive surface:

Test your knife for sharpness by cutting a piece of writing paper cleanly. This is the degree of sharpness you will need for woodworking projects.

How to Make a Featherstick

You can use your knife to make fine, easy to ignite kindling. Make the featherstick elbow to fingertip long and about as thick as your thumb. Choose a stick that is knot-free with a straight wood grain. You can find out how well your featherstick works by lighting the curls and trying to make the shaft burn. A good featherstick creates enough heat to start the shaft on fire.



Cutting Down Saplings With a Knife

Almost any green tree that is wrist thick or less can be bent and easily cut down with a knife. Some deciduous trees, like black poplar or cottonwood, that are up to 10 cm in diameter have been cut down in this way. A frozen tree is more difficult to cut down. It is more easily broken after starting the break with a knife cut.

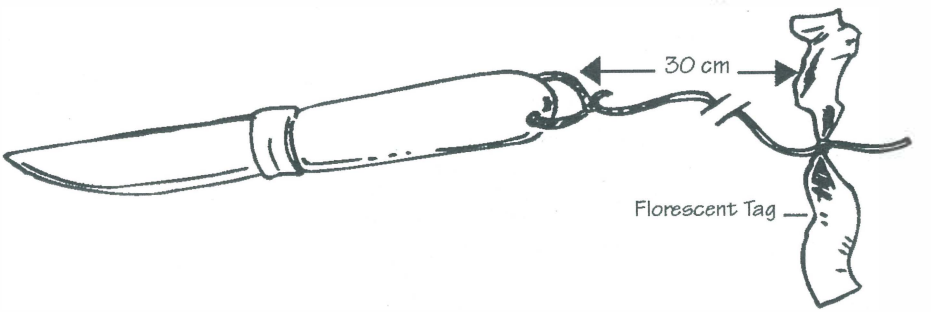
The reason for cutting a tree of this size is to make emergency shelters. **Never** cut green trees needlessly.

Don't Lose Your Knife

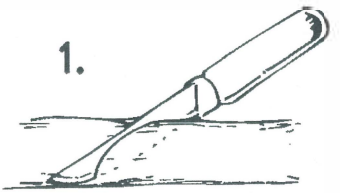
You can make the handle easier to see by painting it florescent orange or by taping it with florescent orange tape.

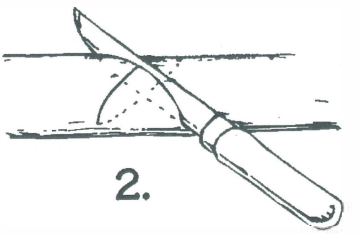
Knives can be accidentally lost when they fall into soft snow. Drill a small hole near the end of the handle for the cord. Tie a piece of nylon cord about 30 cm long with a florescent tag on to the end of the knife. The tag should still be visible on the surface of the snow even though the knife is buried.

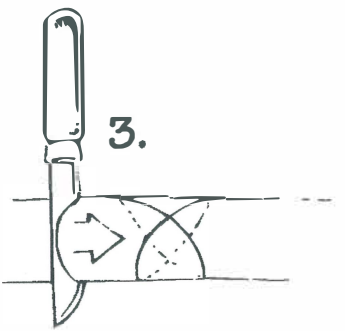
Always keep your knife in its sheath when you are not using it. Attach a shoelace or cord to the sheath and carry your knife around your neck.



How to Make a Pot Hook







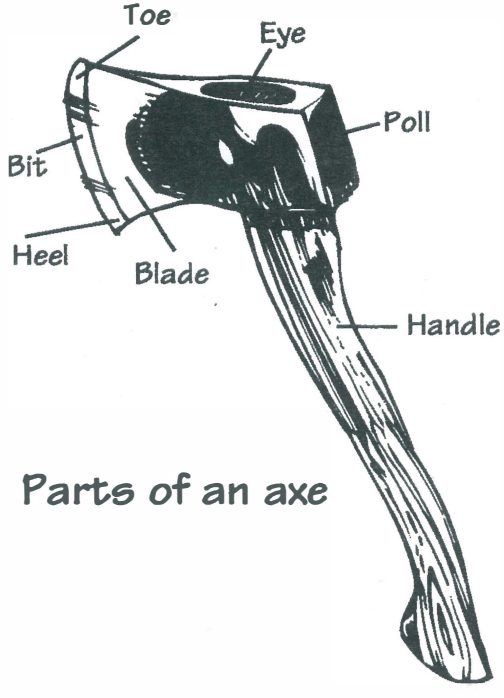
Finished pot hook

Source: *Text and illustrations courtesy of Mors Kochanski*

Axe and Saw Safety

Always use an axe or saw under adult supervision.

An axe can be used to cut down trees, chop wood and with the use of a flint, to start a fire. The best way to learn how to use an axe is to work with an experienced adult who can teach you proper safety techniques.



Parts of an axe

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Never carry an unsheathed axe. Carry the axe at your side with the blade pointing slightly away from you. If you fall, throw the axe away from your body, being careful of anybody walking beside you.

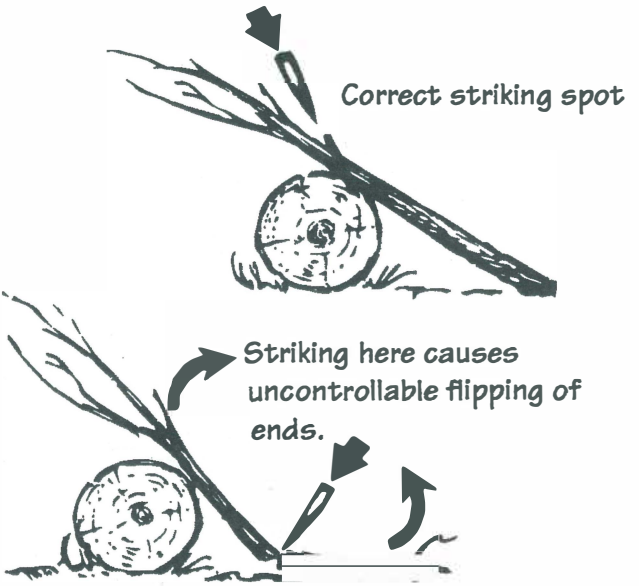
Axe Safety

Always ask your leader before picking up an axe. If an axe head is loose, do not use it until it has been tightened.

In extremely cold weather, always warm the axe before using it. Cold temperatures make the metal brittle and could cause the axe blade to snap.

Always use a chopping block such as a sturdy stump or log.

Always make sure no one is standing in the area of the swing of your axe. **Always** make sure there are no obstructions. Practice using an axe only when your leader is watching you. Put the axe away in the proper storage place immediately after using it. Tell your leader if the axe is dull. A dull axe can be dangerous. A sharp blade will cut into a log, but a dull blade may bounce off the mark and cause a serious accident.



Saws

You can also cut firewood and cut down trees with a saw. Some reasons to use a saw are:

- You will use less energy to saw wood than you will to chop wood with an axe.
- Saws can be used in confined or awkward spaces.
- Saws are useful when you need to cut wood of a specific size, such as wood for a stove.

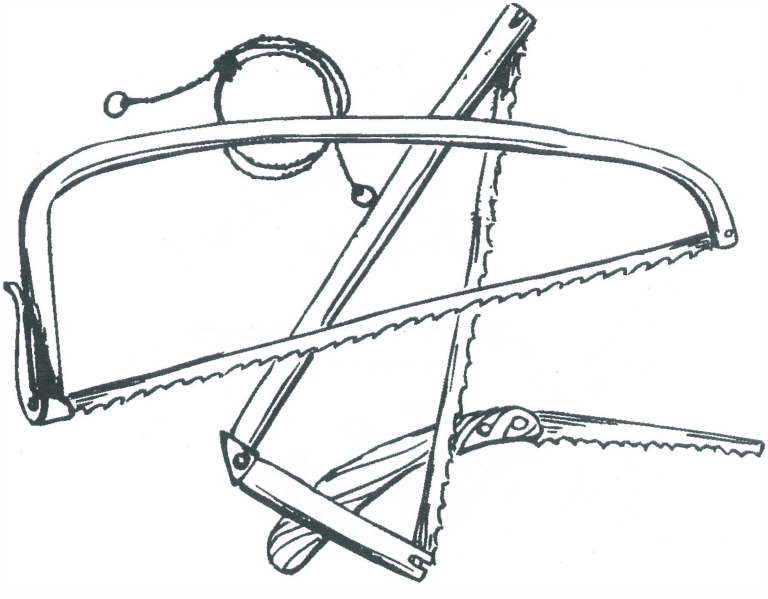
Saws can be a very useful camp tool. Learn how to select, use and care for them.

Choosing a Saw

First decide why you will use a saw. Most wardens in the Green Tree, Trailblazer program use a saw to cut firewood. A saw should have the following features:

- A strong frame that will support the blade while you are sawing.
- A hand guard to protect your knuckles.
- A blade guard to prevent clothing and equipment damage when the saw is not being used. You could be cut if you fell on a saw.
- Choose a saw that you can easily use and is the right size for you.
- A straight blade. A twisted or bent blade is impossible to use.

A few different styles:



Safety

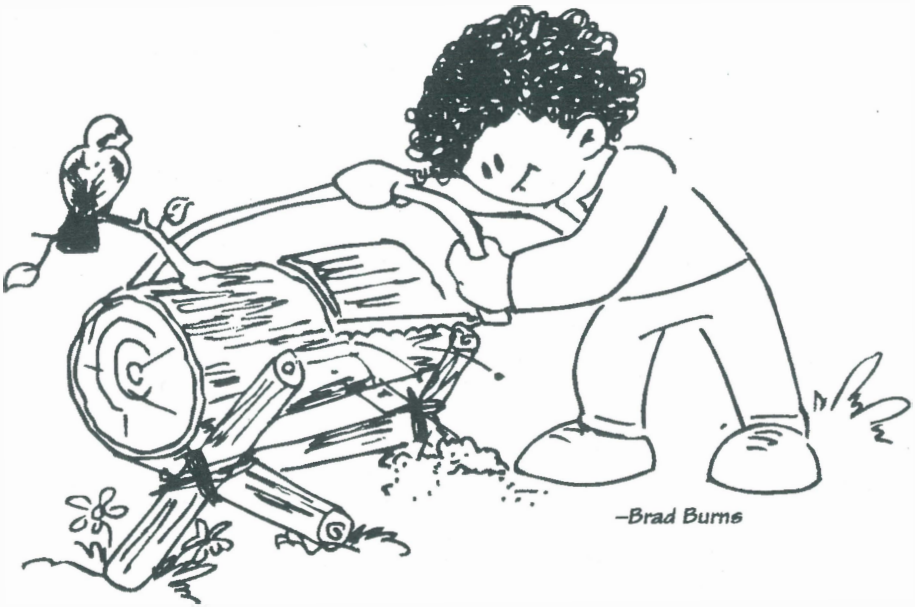
Always ask permission to use a saw. Practice using a saw with your club leader. Here are some tips to remember:

- Place the wood you are sawing on the ground or on low supports. Make sure it will not move when you are sawing. Ask another warden or a club leader to hold the wood steady.

- Remove the guard from the saw blade.
- Kneel down beside the wood.
- Make a groove in the wood.
- Saw back and forth using only the weight of the saw.

As you become more skilled, you can saw more forcefully in a downward motion. Practice sawing with a long stroke. This takes less effort than short strokes.

Sawing with a friend is fun and cuts the wood faster. Try it!



Source: *Text and illustrations courtesy of Mors Kochanski*

Stove and Lantern Safety

Always practice and use a stove or lantern under adult supervision.

Lanterns and stoves are important items in camping equipment. Learn to use them safely.

Remember To:

- Make sure your stove is working properly **Before** taking it on an outing.
- **Always** carry your fuel safely in a proper container. Keep it away from food.
- **Never** use a stove in a tent. It could tip over and start a fire.
- Check with your club leader to make sure there is good ventilation **Before** using your stove in a snowhole or cave.
- **Read** and **Follow** the instructions **Carefully** when you are lighting the stove.
- Shelter your stove from the **Wind** when you are cooking.
- Turn your stove **Off** and **Clean** it properly before putting it away.

Coleman Stoves

General Instructions

To store and transport: Allow stove to cool before handling and storing. Unscrew filler cap to release pressure, then re-tighten before storing. Ensure control lever remains in **Off** position while transporting it.

Keep burner clean: An obstruction such as a burned match head near the burner will produce a yellow flame at that point.

Keep tank clean: Rinse it occasionally with clean fuel.

Before storing stove: Clean stove carefully and leave fuel in tank. For long periods, empty tank and leave filler cap off stove.

Generator: Avoid problems by keeping a spare generator appropriate to your lantern or stove on hand.

Pack nuts at the control lever and regulating lever (see parts list). Must be kept tight to prevent fuel leakage.

1. Shut Off Burner When not in Use or When Filling the Tank

Ensure control lever is in the **Off** position by turning it clockwise to the left. Do not force the control lever past the **Off** position.

2. To Fill Tank

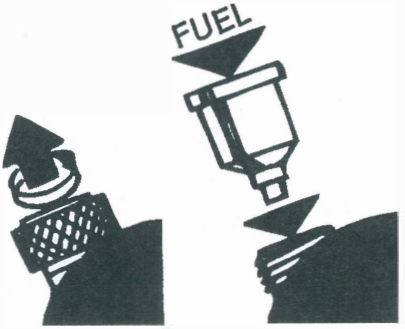
a) **Unscrew** filler cap.

b) Place stove in **level** position. **Do Not Tip**. Over-filling will cause stove to flood.

c) Fill with **Coleman fuel** using funnel.

d) **Replace** filler cap and tighten finger tight.

e) **Wipe** off any spilled fuel.

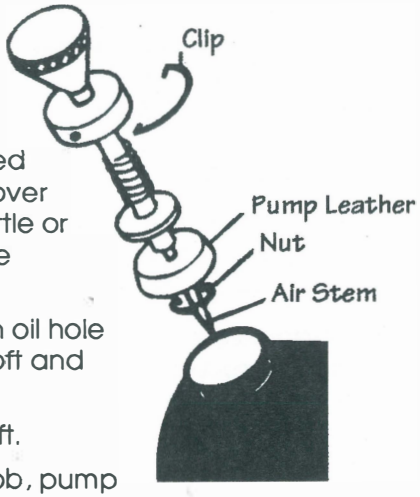


Never remove or loosen filler cap while stove is operating or near other heat sources. Do not refill stove while burner is hot.

3. To Pump

a) Ensure control lever is in **Off** position and filler cap is firmly closed.

b) **Test Pump** with pump knob in closed position (turn right), place thumb over hole in pump knob and pump. If little or no resistance is felt, oil and replace pump leather (see note below).



Periodically, place 3 or 4 drops of oil in oil hole in pump cap to keep pump leather soft and pliable.

c) **Turn** pump knob two (2) turns to left.

d) With thumb over hole in pump knob, pump 20 or more strokes of air into tank.

e) **Close** pump knob firmly to the right.

Caution: Remove cooking utensils before pumping stove.

4. To Clean Tip

Note: Regulator lever is located directly above pump assembly.

a) Turn regulator lever to **Min** position (B) and back to **Max** position (A).

b) Leave regulator lever at **Max** position to light stove.

5. To Light Stoves

a) **Do not** lean over stove while lighting.

b) Hold lighted match to burner bowl.

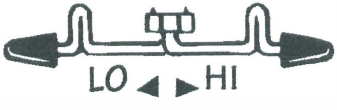
c) Turn control lever to **Light** position pointing down.

d) Approximately 1 minute after lighting stove, turn control lever to right to the **Run** position. **Do not force** lever past **Run** position.

e) Pump more air into tank if required.

Note: Persistent orange flame indicates flooding. Turn control lever to Off position and allow flame to burn out. Repeat above instructions.

6. To Regulate



a) Flame can be adjusted by slowly moving regulator lever to any position between **Max** and **Min**.

7. To Turn Off

a) Set regulator lever to **Max** position.

b) Turn control lever left to **Light** position (clockwise) for 30 seconds.

c) Turn control lever left to **Off** position (clockwise). Do not force control lever past off position.

d) Flame will extinguish slowly.

1. How to Use Your Coleman Lantern

Caution: Lanterns consume oxygen. If a lantern is used inside an enclosed area, provide ventilation (fresh air opening) of at least 5 square inches. Increase fresh air openings as marked for each additional appliance.

1. **Read** all instructions thoroughly before operating lantern.
2. **Do not** use lantern as a space heater.
3. **Never** remove or loosen filler cap while lantern is operating near open flame, other heat sources or while top of lantern is hot to the touch.
4. **Do not** operate lantern if mantle has a hole in it.
5. **Do not** leave lantern unattended while operating.
6. **Always** fill and light lantern out of doors away from open flame, heat and combustibles.
7. **Never** allow tents, sleeping bags, clothing or other combustible materials to come within the distance indicated on the lantern label.
8. Use only Coleman fuel or clean naphta. **Never** use automotive fuel (leaded or unleaded).
9. **Do not** allow anyone who has not read the instructions, to fill, light or adjust lantern.

2. To Fill Tank

a) Turn control knob to **Off** position (clockwise). Fig. 1

b) Unscrew filler cap. Fig. 2

c) Place lantern in level position and using a funnel, fill with Coleman fuel.

Do Not Tip—overfilling will cause lantern to flare-up on lighting.

d) Replace filler cap, turning finger-tight.

e) **Wipe off** any spilled fuel.

Note: Never remove or loosen filler cap while lantern is operating or near other heat sources.

Do Not refill while top of lantern is hot to the touch.

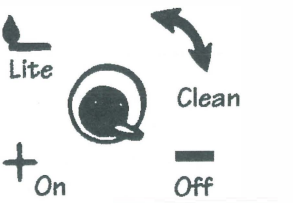
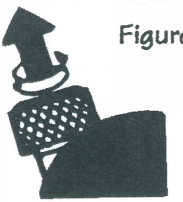
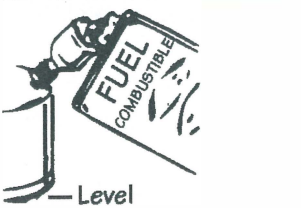
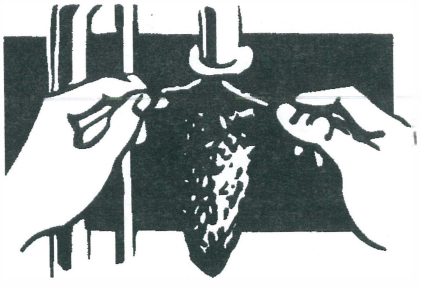


Figure 2.





3. To Attach Mantle



a) **Remove** lantern handle (bail) from sockets.

b) **Remove** ventilator and glass globe.

c) **Tie** mantle around groove in burner cap (see illustration). Use the correct mantle as shown by the number on the globe base rest (collar).

d) Distribute folds of mantle **evenly** around burner cap.

e) **Cut** off surplus string.

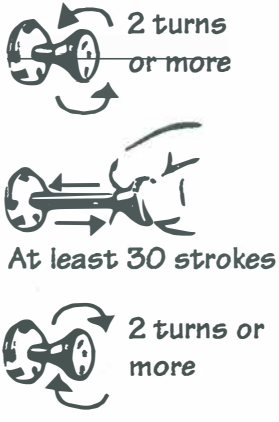
f) Light bottom of **mantle** and **burn** evenly until only white ash remains.

g) **Allow** mantle to **cool** before lighting lantern.

h) Re-assemble lantern making sure **heat shield** is in place.

Always use genuine Coleman mantles.

4. To Pump



a) Ensure control knob is in **Off** position and filler cap is firmly **closed**.

b) **Test pump** with pump knob in **closed** position (**turn right**) by placing thumb over hole in pump knob and pumping. If little or no resistance is felt, oil or replace the pump leather. If pump resists, go to step C.

c) **Open** pump knob by turning two (2) turns to left.

d) With thumb over hole in pump knob, **pump 30 or more strokes** of air into tank. If tank is not full of fuel, more strokes will be required.

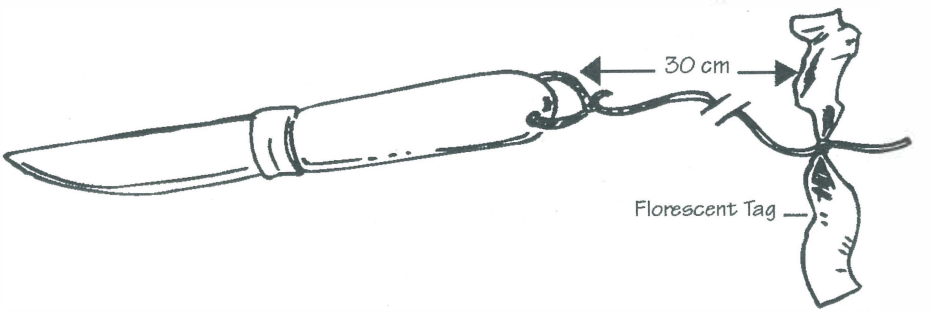
e) **Close** pump knob by turning to **right** until tight.

Don't Lose Your Knife

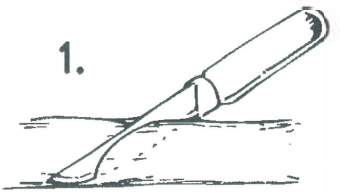
You can make the handle easier to see by painting it florescent orange or by taping it with florescent orange tape.

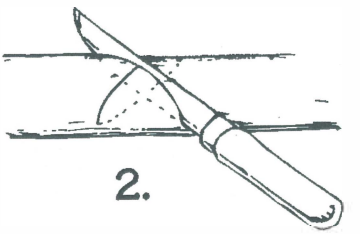
Knives can be accidentally lost when they fall into soft snow. Drill a small hole near the end of the handle for the cord. Tie a piece of nylon cord about 30 cm long with a florescent tag on to the end of the knife. The tag should still be visible on the surface of the snow even though the knife is buried.

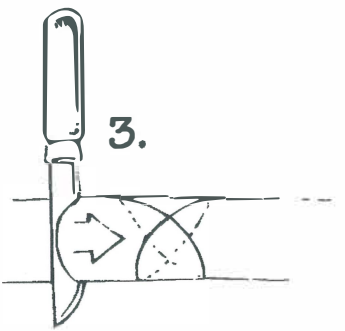
Always keep your knife in its sheath when you are not using it. Attach a shoelace or cord to the sheath and carry your knife around your neck.



How to Make a Pot Hook







Finished pot hook

Source: *Text and illustrations courtesy of Mors Kochanski*

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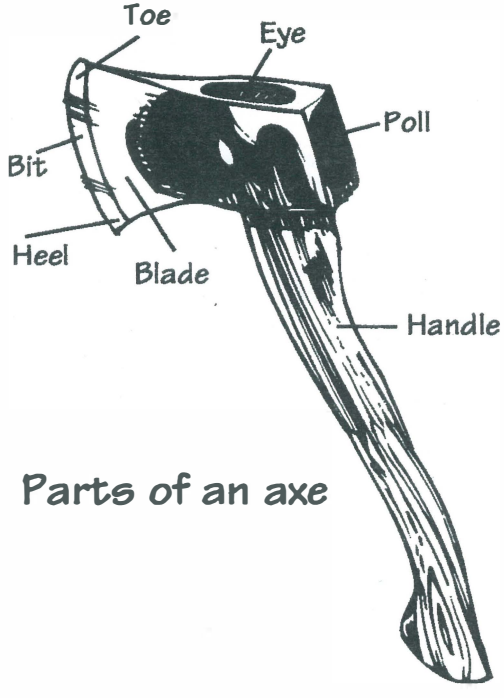

Parts of an axe

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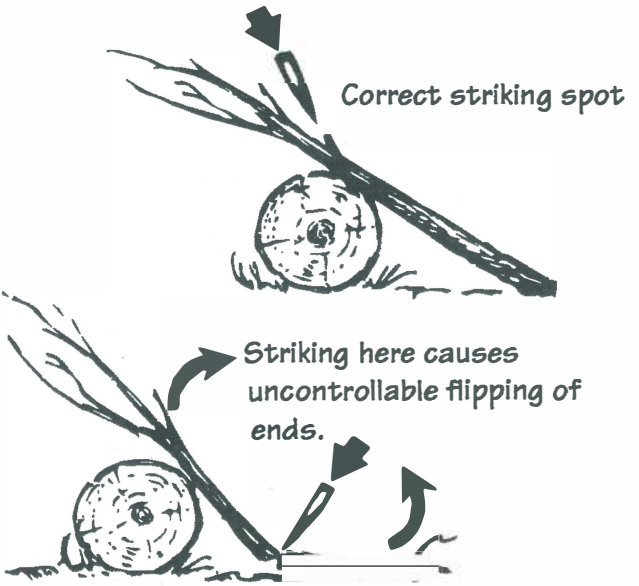

Saws

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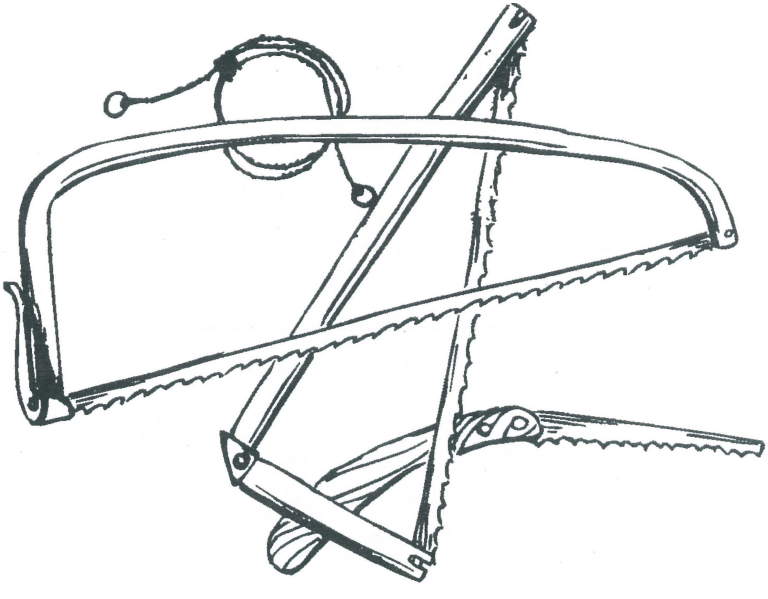

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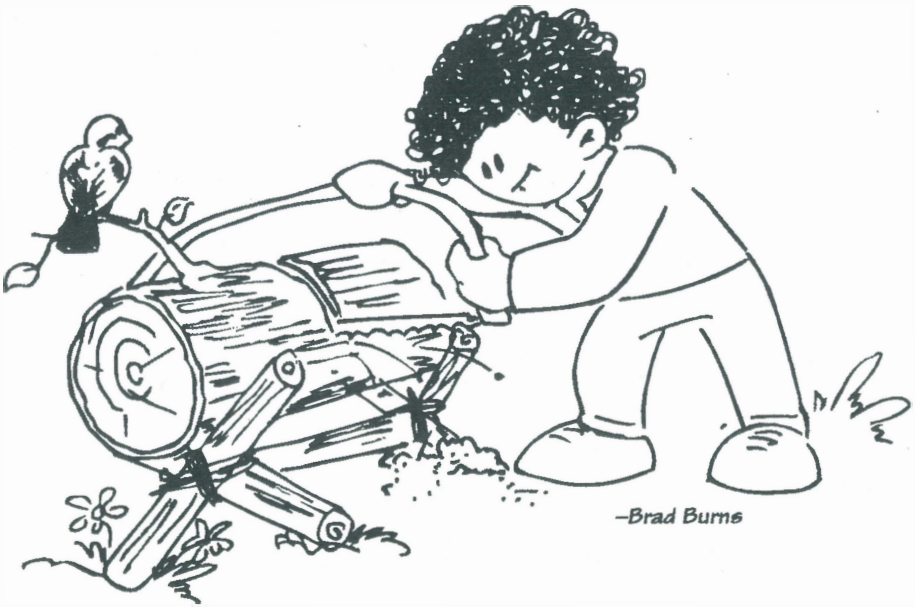
Sawing with a friend is fun and cuts the wood faster. Try it!



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Stove and Lantern Safety

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Remember To:

- Make sure your stove is working properly **Before** taking it on an outing.
- **Always** carry your fuel safely in a proper container. Keep it away from food.
- **Never** use a stove in a tent. It could tip over and start a fire.
- Check with your club leader to make sure there is good ventilation **Before** using your stove in a snowhole or cave.
- **Read** and **Follow** the instructions **Carefully** when you are lighting the stove.
- Shelter your stove from the **Wind** when you are cooking.
- Turn your stove **Off** and **Clean** it properly before putting it away.

Coleman Stoves

General Instructions

To store and transport: Allow stove to cool before handling and storing. Unscrew filler cap to release pressure, then re-tighten before storing. Ensure control lever remains in **Off** position while transporting it.

Keep burner clean: An obstruction such as a burned match head near the burner will produce a yellow flame at that point.

Keep tank clean: Rinse it occasionally with clean fuel.

Before storing stove: Clean stove carefully and leave fuel in tank. For long periods, empty tank and leave filler cap off stove.

Generator: Avoid problems by keeping a spare generator appropriate to your lantern or stove on hand.

Pack nuts at the control lever and regulating lever (see parts list). Must be kept tight to prevent fuel leakage.

1. Shut Off Burner When not in Use or When Filling the Tank

Ensure control lever is in the **Off** position by turning it clockwise to the left. Do not force the control lever past the **Off** position.

2. To Fill Tank

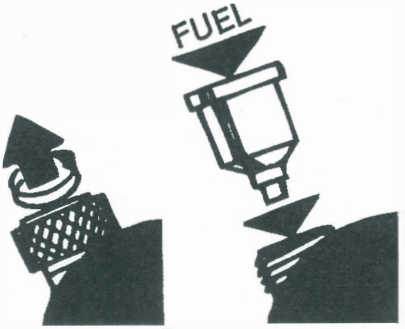
a) **Unscrew** filler cap.

b) Place stove in **level** position. **Do Not Tip**. Over-filling will cause stove to flood.

c) Fill with **Coleman fuel** using funnel.

d) **Replace** filler cap and tighten finger tight.

e) **Wipe** off any spilled fuel.

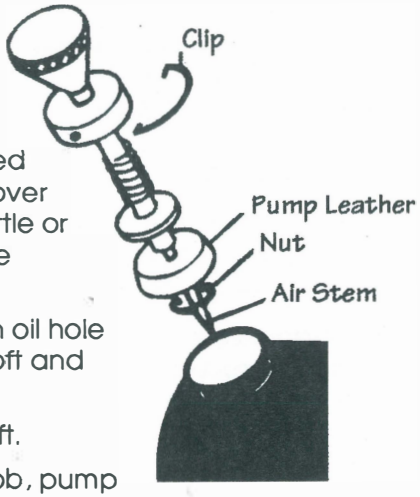


Never remove or loosen filler cap while stove is operating or near other heat sources. Do not refill stove while burner is hot.

3. To Pump

a) Ensure control lever is in **Off** position and filler cap is firmly closed.

b) **Test Pump** with pump knob in closed position (turn right), place thumb over hole in pump knob and pump. If little or no resistance is felt, oil and replace pump leather (see note below).



Periodically, place 3 or 4 drops of oil in oil hole in pump cap to keep pump leather soft and pliable.

c) **Turn** pump knob two (2) turns to left.

d) With thumb over hole in pump knob, pump 20 or more strokes of air into tank.

e) **Close** pump knob firmly to the right.

Caution: Remove cooking utensils before pumping stove.

4. To Clean Tip

Note: Regulator lever is located directly above pump assembly.

a) Turn regulator lever to **Min** position (B) and back to **Max** position (A).

b) Leave regulator lever at **Max** position to light stove.

5. To Light Stoves

a) **Do not** lean over stove while lighting.

b) Hold lighted match to burner bowl.

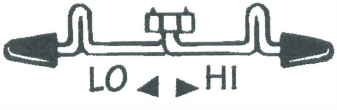
c) Turn control lever to **Light** position pointing down.

d) Approximately 1 minute after lighting stove, turn control lever to right to the **Run** position. **Do not force** lever past **Run** position.

e) Pump more air into tank if required.

Note: Persistent orange flame indicates flooding. Turn control lever to Off position and allow flame to burn out. Repeat above instructions.

6. To Regulate



a) Flame can be adjusted by slowly moving regulator lever to any position between **Max** and **Min**.

7. To Turn Off

a) Set regulator lever to **Max** position.

b) Turn control lever left to **Light** position (clockwise) for 30 seconds.

c) Turn control lever left to **Off** position (clockwise). Do not force control lever past off position.

d) Flame will extinguish slowly.

1. How to Use Your Coleman Lantern

Caution: Lanterns consume oxygen. If a lantern is used inside an enclosed area, provide ventilation (fresh air opening) of at least 5 square inches. Increase fresh air openings as marked for each additional appliance.

1. **Read** all instructions thoroughly before operating lantern.
2. **Do not** use lantern as a space heater.
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a) Turn control knob to **Off** position (clockwise). Fig. 1

b) Unscrew filler cap. Fig. 2

c) Place lantern in level position and using a funnel, fill with Coleman fuel.

Do Not Tip—overfilling will cause lantern to flare-up on lighting.

d) Replace filler cap, turning finger-tight.

e) **Wipe off** any spilled fuel.

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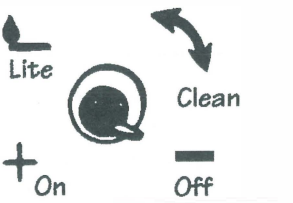
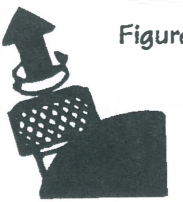
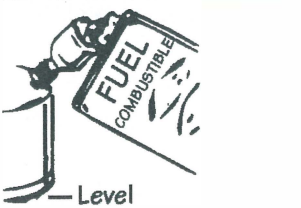
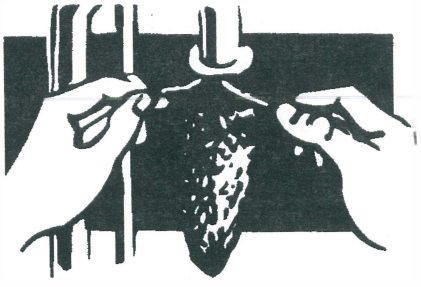


Figure 2.





3. To Attach Mantle



a) **Remove** lantern handle (bail) from sockets.

b) **Remove** ventilator and glass globe.

c) **Tie** mantle around groove in burner cap (see illustration). Use the correct mantle as shown by the number on the globe base rest (collar).

d) Distribute folds of mantle **evenly** around burner cap.

e) **Cut** off surplus string.

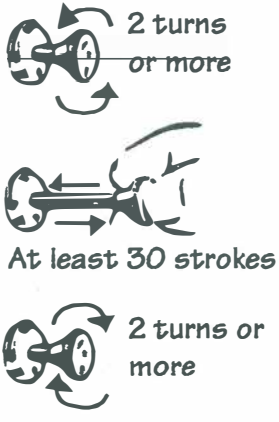
f) Light bottom of **mantle** and **burn** evenly until only white ash remains.

g) **Allow** mantle to **cool** before lighting lantern.

h) Re-assemble lantern making sure **heat shield** is in place.

Always use genuine Coleman mantles.

4. To Pump



a) Ensure control knob is in **Off** position and filler cap is firmly **closed**.

b) **Test pump** with pump knob in **closed** position (**turn right**) by placing thumb over hole in pump knob and pumping. If little or no resistance is felt, oil or replace the pump leather. If pump resists, go to step C.

c) **Open** pump knob by turning two (2) turns to left.

d) With thumb over hole in pump knob, **pump 30 or more strokes** of air into tank. If tank is not full of fuel, more strokes will be required.

e) **Close** pump knob by turning to **right** until tight.

5. To Light

a) Ensure lantern is **pumped** up.

b) **Do not** lean over lantern while lighting.

c) Insert lighted match through hole in bottom of burner frame (Fig. 1).

d) Turn control knob to **Lite** position (Fig. 2).

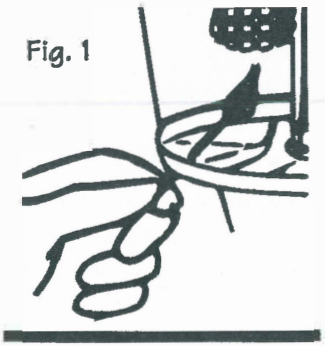


Fig. 1

Note: Should lantern fail to light or match goes out before ignition, turn control knob to the OFF position and repeat above instructions.

e) When mantle burns **bright white**, turn control knob to **On** position (Fig. 3).

f) **Add** more air pressure to tank. Air pressure may be added while lantern is in operation. Good air pressure is important for maximum light output.

g) Spark lighters are **not recommended** because they do not always provide a positive ignition. **Always** use a lighted match or taper to ensure proper lighting.

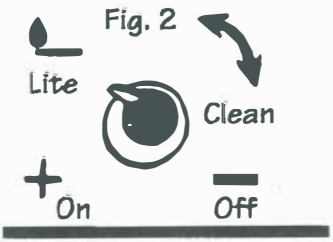


Fig. 2

Note: Do not leave bail (carrying handle) in upright position while lantern is in operation.

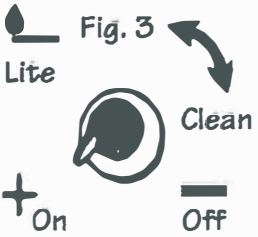
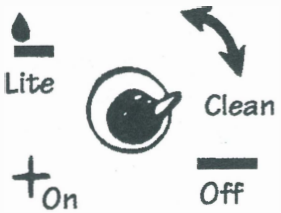


Fig. 3

6. To Clean

a) When the control knob is turned from the **Off** position to the **Lite** position, it passes the **Clean** position. When this occurs, a needle inside the generator cleans the debris from the orifice (gas tip), allowing fuel to reach the mantle.

b) Should light begin to pulsate or grow dim, add more air pressure and turn control knob to **Clean** position (Fig. 9) and back to **On** position. If condition continues the lantern may require filling.



7. To Turn Off

Turn control knob to **Off** position. Lantern will begin to grow dim and extinguish after a minute or two.

Note: Allow lantern to cool before handling.

Search and Rescue

What To Do If You Are Lost

Hug a tree! The tree is your friend. Hug the tree and talk to it if you feel afraid. Stay near the tree. Someone will find you.

Yell at noises! Yell at noises that scare you. You will frighten animals away and help searchers to find you.

Whistle! Blow your whistle loudly **three times**, wait a minute, then blow three more times. Keep doing this until you are found.

Stay at your tree! If you are cold, put on more clothes from your daypack. Jump up and down or walk around your tree to get warm. Drink some water from your daypack.

"I'M HERE"! If you see someone, shout **"I'm here"**. They are trying to find you, so let them know you see them.

Finding A Lost Item

1. Stand still.
2. Try to find the missing item. Look around you, in your pockets, in your daypack.
3. Think. Try to decide where it might be.
4. Tell your leader what you've lost and what you've done so far.
5. With your leader, decide what to do such as send one person to look for it; have everyone search for it; or other ideas that could work.
6. Follow your leader's instructions.

Finding A Lost Person On A Dayhike

1. When you hear the "lost warden" whistle, run to your leader
2. Stand still. Answer your leader's questions.
3. Follow your leader's instructions.

Ecology

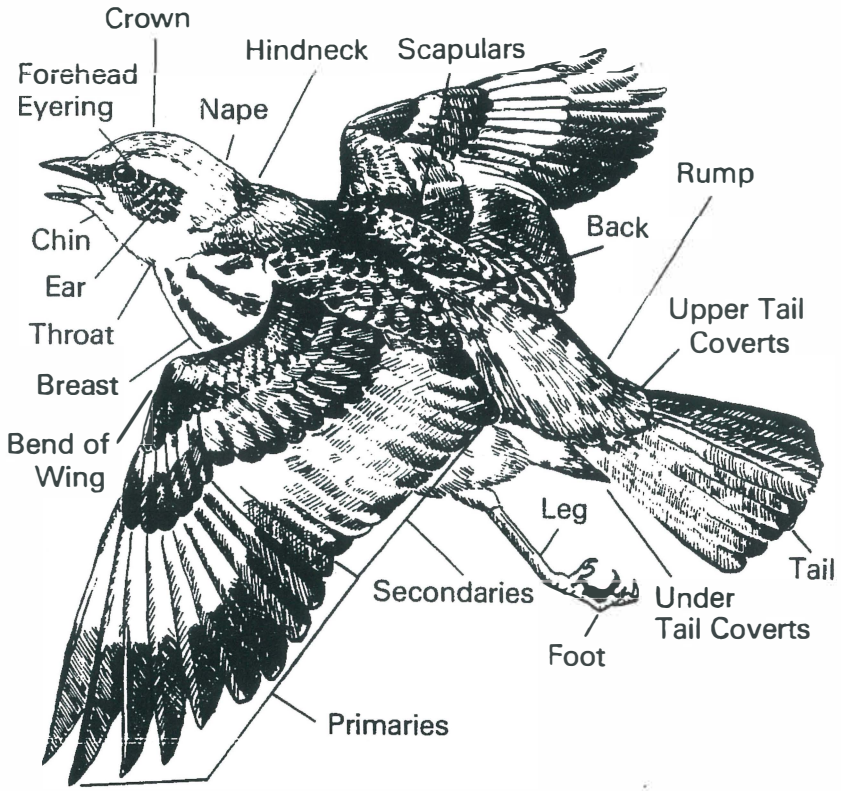
Ecology activities will help you to explore how plants and animals live together in natural areas. In the Trailblazer Green Tree program, you will:

- Learn how to become a birdwatcher and identify common birds,
- Make crafts from natural materials,
- Learn about the hazards of forest fires,
- Learn about different habitats of animals and trees,
- Learn about the Watchable Wildlife program,
- Learn about and identify endangered species, and
- Learn how to predict the weather on club campouts.

Birdwatching

Here's how to become a good birdwatcher:

- Get a good illustrated bird book. Some books to look for: Peterson's Field Guide; The Birds of Alberta by W. Salt and J. Salt, Hurtig Publishers 1976; A Guide to Field Identification of North American Birds by C. Robbins, B. Bruun and H. Zim, Golden Press; Birds of the Canadian Rockies by G. Scotten, T. Ulrich and E. Jones, Western Producer Prairie Books, 1992.
- Learn the major parts of a bird's body.
- Use a pair of field glasses (binoculars) that will help you to get a closer view of a bird and to pick out minor differences in appearance. This is very important because many birds are very similar in plumage (colour) except for very minor differences.



The Structure of a Bird

The Six "S" System

1. **Sight:** The colours, markings, bill and feet of each bird is unique.


Duck


Goose (Snow)

- Plumage is the first thing you notice on most birds. Slight changes in colour can signify a different species. Look for colour changes during different seasons too.
- Bills vary in shape with different birds. Noticing the shape of the bill quickly helps identification.
- Feet help in identification.


Curlew


Falcon

2. **Shape:** Many birds are grouped by their shape; for example, ducks and hawks.


Avocet


Tern

3. **Size:** The size of a bird aids identification. A small thrush is easily distinguished from the larger hawk.

4. **Sound:** Songs tell a difference. Many birds sing and each one has its own song or sound. Sometimes just hearing a bird's song can lead to identification. Listen to the robin's song; listen to a meadowlark. Is there a difference? Try and remember each one's song.


Merganser


Sandpiper


Gull


Coot

5. **Site:** Where you find the bird. Each bird has preferred habitat areas where it is usually found.

6. **Season:** The time of year that you are most likely to find some birds.


Grosbeak


Grouse

Now use the Six "S" System to identify 5 birds.

Use the bird clue book on the following pages to record your observations. You can also make your own book by photocopying the pages, cutting them in half and stapling them together.


Sparrow


Warbler


Woodpecker


Hummingbird

Bird Clue Book Pages

SHAPE:

SIGHT:

Feathers:

Feet:

Beak:

Wings:

Markings:

SIZE:

SOUND:

SITE:

SEASON:

WHAT AM I?:

SHAPE:

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SEASON:

WHAT AM I?:

Budding Out

In the spring, buds unfold and grow to become flowers or leaves. Watch three twigs bud out and record your observations in these charts. Draw each twig in the boxes below.

My Twigs	Twig 1	Twig 2	Twig 3
How big is the biggest bud?			
How small is the smallest bud?			
How far apart are the buds?			
How many buds on a twig?			
Are the buds opposite? alternate?			
Are the buds smooth? sticky?			
Are there any marks on the twig?			
Is it a flowering twig? If so, which comes first, flowers or leaves?			
Record any other observations about the twigs.			

Endangered Species

Some sources report that since 1600, about 300 species of wildlife have become extinct worldwide, either directly or indirectly as a result of human activities. In 1991, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed 9 species of mammals, birds, reptiles, amphibians, fish and plants in Canada as being extinct, 10 extirpated, 42 endangered, 50 threatened, 96 vulnerable, 4 uplisted, 2 downlisted and 1 (White Pelican) delisted.

Although extinction is a natural process, excessive and intensive human activities in the environment have caused a dramatic increase in its rate. Loss of habitat as a result of human activity is considered to be the most widespread cause of species extermination.

The definitions of the terms to be used in this activity are consistent with those established by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which are given below:

Extinct: Any indigenous species of fauna or flora formerly indigenous to Canada no longer known to exist elsewhere.

Extirpated: Any indigenous species of fauna or flora no longer known to exist in the wild in Canada but existing elsewhere.

Endangered : Any indigenous species of fauna or flora that is threatened with imminent extirpation or extinction throughout all or a significant portion of its Canadian range.

Threatened: Any indigenous species of fauna or flora that is likely to become endangered in Canada if the factors affecting its vulnerability do not become reversed.

Vulnerable: Any indigenous species of fauna or flora that is particularly at risk because of low or declining numbers, occurrence at the fringe of its range or in restricted areas, or for some other reason, but is not a threatened species.

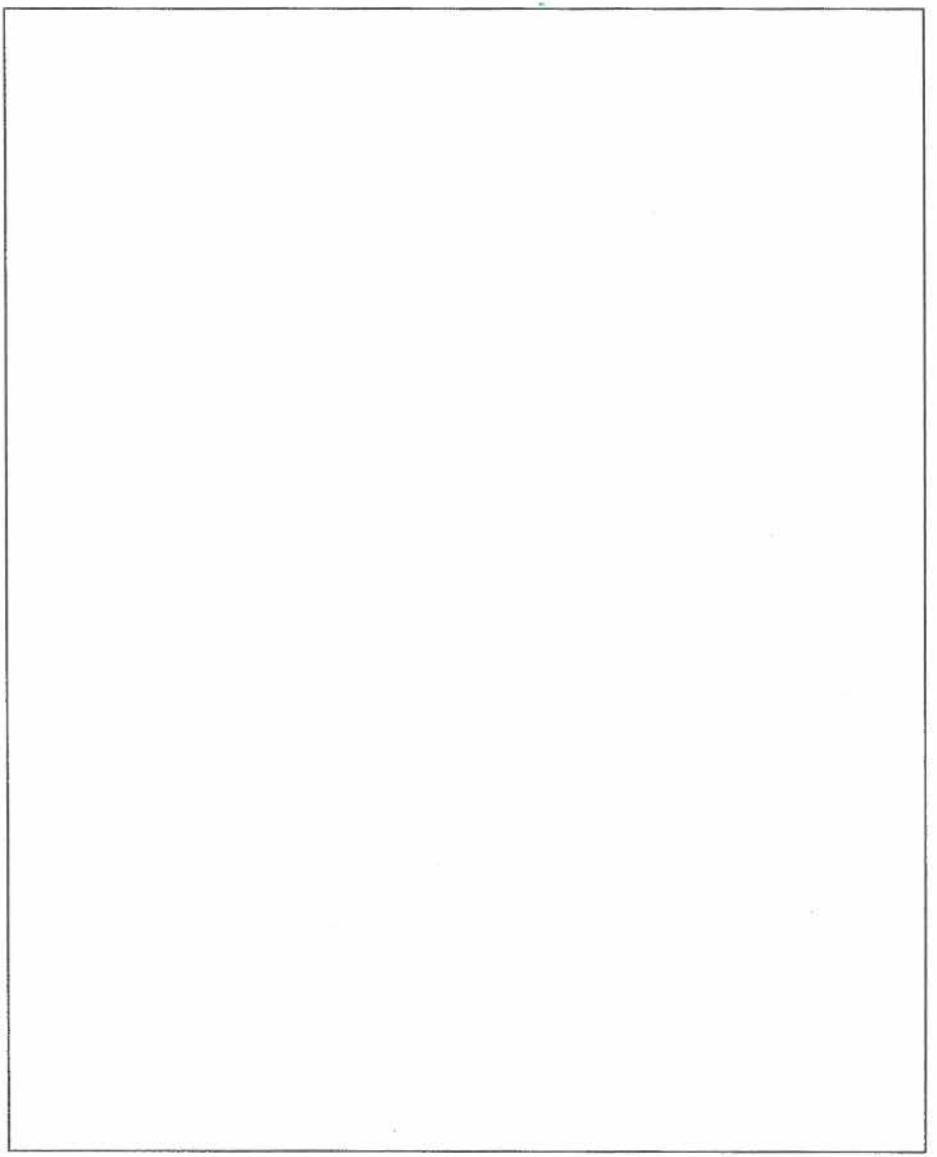
Delisted: A species previously designated by COSEWIC whose national status is no longer vulnerable, threatened, endangered or extirpated. Designated as threatened from 1976-1986, the White Pelican was delisted by COSEWIC in 1987.

Downlisted: A species previously designated by COSEWIC whose national status moves from one category to a less-vulnerable category. Designated as endangered from 1977 to 1987, the Wood Bison was downlisted by COSEWIC in 1988.

Wildlife species form the fabric of nature on which we rely for medicine, food, shelter, clothing, recreation and cultural and spiritual inspiration. Every time a wild plant or animal becomes extinct, we lose the opportunity to explore new options for food and medicine–forever.

Source: The Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

Investigate endangered plants and animals in your area. Decide how they are classified. Make a drawing of one such plant or animal in its habitat in the box below.



What About Fish?

What Is A Fish?

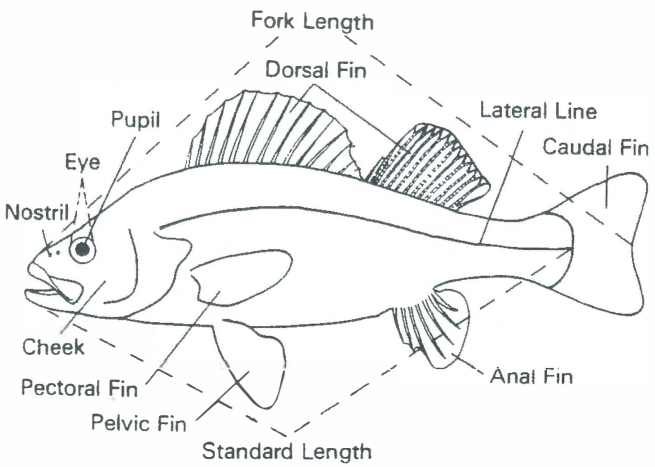
What are the oldest living as well as most numerous vertebrates in the world?...Fish!

True fishes have flexible backbones. They are flexible because they are made up of small pieces of bone or cartilage called vertebrae—thus the name, vertebrates. Being a vertebrate is a characteristic in common with all the other forms of life that have evolved from fish–amphibians, reptiles, birds and mammals.

Fish live in water and breathe by means of gills. Gills are the fragile filaments of tissue that are filled with blood. The oxygen in the water is taken up by the blood and circulated to all parts of the fish's body. Its eyes have no lids. Its heart has two chambers, as compared to three in reptiles and four in mammals. It is coldblooded, meaning the blood within the fish's body is usually the same temperature as the surrounding waters. The skin is covered with a film of slippery, protective, healing mucus. The fish moves, balances and stops itself by means of fins.

Fishes living today can be divided into three groups: round mouth eels (lampreys and hagfish), the cartilaginous fish (sharks and rays), and the bony fishes (all others).

Parts of a Fish



Where Are Fish Found?

Every fish species has its own "preferred habitat," or that place where it lives and grows the best. Many factors determine where a certain species will live:

- The preferences and tolerances to such things as temperature and the amount of oxygen in the water.
- The relationships to other species in the area.
- The availability of spawning areas.
- The location of food.

During the summer, the body of the fish is always about the same temperature as the water around it; however, each species seeks a particular range in temperature. The northern pike and yellow perch have a relatively high temperature preference and are found in shallow waters where the temperature may be as high as 17°C. Lake whitefish and lake trout have a relatively low temperature preference and live in deeper, cooler waters where the temperature may be as low as 7°C. Fish can usually swim faster and are healthiest at their preferred temperature. If they are forced into waters where the temperature is either too high or low, they die.

Feeding Habits

After hatching, young fish receive food from their yolk sac. In the early stages of life, most fish eat both plants and animals. As they continue to grow toward adulthood, their feeding habits change. Some fish eat plankton; some feed only on plants; some feed on animal matter. In the last group are fish like pike and walleye. Trout, grayling and whitefish are insect eaters.

An easy way to find out what a fish feeds on is the shape and position of the mouth. If the mouth is a grasping, terminal type (mouth is found at the end of its snout), large with sharp teeth, the fish is carnivorous, (i.e., pike, trout, walleye, etc.) If the mouth is subterminal (the snout extends past the mouth), sucking type, usually toothless, the fish feeds on invertebrates and plant material found living on the bottom (i.e., suckers, sturgeon, etc.) Mid-day is the least active part of any of the daylight hours, but most fish will feed whenever prey are easily available. There are certain times of the day when fish are more prepared to take food. Some are diurnal and feed during the day. Others are nocturnal and do most of their feeding at night. Most large fish (i.e., pike and trout) are diurnal and find food by taste and sight. Many bottom feeders (i.e., sucker and ling cod) are nocturnal and locate their food with a keen sense of taste and smell because their eyes are useless in the blackness of night.

Pond Study

Making a Pond Study Kit

Needs

- sheet of clear plastic
- white sheet or table cloth
- magnifying glasses or box magnifiers to view the "creatures" after you have collected them
- two turkey basters (for collecting water containing microscopic creatures)
- plastic containers (e.g., margarine tubs)
- sieves
- 1 pond guide such as Peterson's Field Guide to Insects/Fish

Find a depression on the ground close to the water. Lay the white sheet on the ground and place the plastic over it, rolling up the edges slightly to contain the water. The light background makes it easier to see the discoveries. Use the containers to collect pond water and place the water in the "artificial pond" you have created. Use the sieves in the lake or stream to catch minnows and observe them.

Making a Sieve

You will need:

- a wire clothes hangers
- old pantyhose, white if possible.
- wire twist ties from bread bags.

Cut pantyhose into squares about 6" by 6". Bend wire hanger as shown. Place pantyhose over round opening and secure with twist tie. This is a great tool for reaching into a pond or creek and catch small insects and fish.

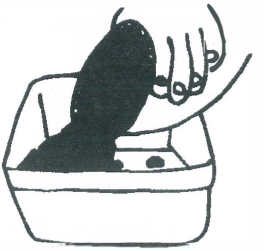
Nature's Recycling

Next time you are in the bush, look at the bottom of a pile of dead leaves. You will notice a dark crumbly substance like soil. This is where the leaves have rotted to make what is called "humus". The layers above the humus are called leaf litter.

In the bush, leaves are dying and being replaced all the time. A deep layer of leaf litter and humus can build up, catching and nourishing seeds from the trees above.

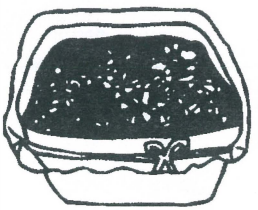
You can grow a garden by collecting leaf litter, keeping it warm and moist, and seeing what grows. Start your garden in the early summer.

Collect leaf litter from under a number of different trees. Put it into plastic bags, and close with a rubber band or tie so that it does not dry out.

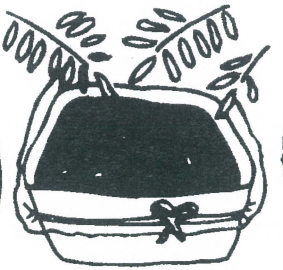


Make two or three holes in the bottom of a plastic ice cream container. Half-fill the container with soil.

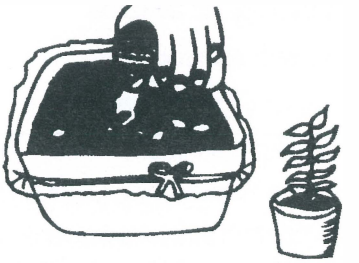
Fill the container to within 2 cm of the top with leaf litter. Pack it down firmly and add 2-3 cups of water, depending on how damp the leaf litter is already.



Cover with a piece of clear plastic (e.g., saran warp). Make sure to leave plenty of air space. Leave the container in a cool, shady spot.



Your first seedlings should appear in two or three weeks. When a number of seedlings are showing, perforate the plastic and water the plants.



When seedlings are 5 cm tall, plant the strongest ones in pots. Plant in a shady part of the garden the following spring.

Forest Fires

What is Fire?

A fire needs three things:

- **Air**
- **Fuel**
- **Heat**

The Fire Triangle

Types of Forest Fires

There are three types of forest fires:

Crown Fires

Crown fires are fierce, spectacular fires that race through the tree tops, driven by the updrafts of heat from below and from winds. The heat can become intense, and the fire can advance along the tree tops, sometimes jumping great distances to start new fires. It is the fastest-spreading fire, outrunning any human being or animal.

1. Crown Fire

Surface Fires

Surface fires are the most common kind. They burn on the ground and can consume all vegetation.

2. Surface Fire

Ground Fires

Ground fires are very dangerous because they are hard to reach. They bury themselves in deposits of leaf mold, peat moss or roots of trees and can smoulder for weeks or even months. With the right weather conditions, they flare into activity and may create destructive forest fires. Some can smoulder all winter under the snow. Ground fires can be detected by watching for a wisp of steamy smoke coming out of the snow. On frosty days, this "breath" becomes quite visible. Ground fires are also detected by the use of infrared scanning.

3. Ground Fire

Why Fires Spread

Some forest fires burn quickly, others burn slowly. They can move in different directions and at different speeds. Sometimes they are intensely hot and other times they smoulder without radiating great heat. These differences are caused by three factors:

1. **Fuel**
2. **Weather**
3. **Topography**

Fuels can be divided into two groups:

- **Light or fast-burning fuels**, such as dry grass, dead leaves or needles, brush and small trees. These provide the tinder and help the fire to spread with great speed. Some fuels contain oil (i.e., young poplar leaves) that hastens the spread of the flames.
- **Heavy or slow-burning fuels,** such as logs, stumps, heavy branches and deep duff (the topsoil or partly decayed leaves or needles found under dense stands of trees). As they dry out, they provide the surface fire fuel, burning readily and throwing off great volumes of heat.

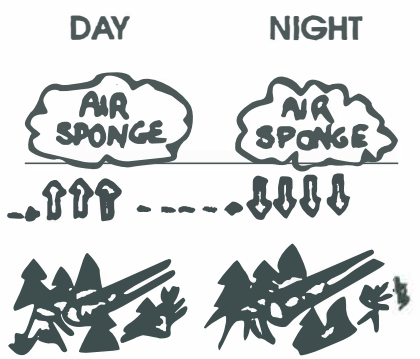
Combustion is caused by the carbon in the fuel combining with the oxygen in the air. It cannot ignite until the temperature of the fuel reaches the kindling point, which is approximately 800°F (426.7°C). Size of the fuel, moisture, weather, topography and other factors can determine the speed of the fire.

Weather

Our knowledge of weather helps greatly in controlling fire.

Moisture

Moisture, in the form of water-vapour, is always in the air. The amount of moisture that is in the air affects the amount of moisture that is in the fuel. The moisture content of fuels is an important factor in firefighting, since wet and moist green fuels will not burn freely. Air is usually drier during the day than at night. As a result, fires burn more slowly at night because moisture is absorbed by the fuel from the damp night air.



Dry air draws moisture from fuel.

Fuel draws moisture from damp air.

Wind

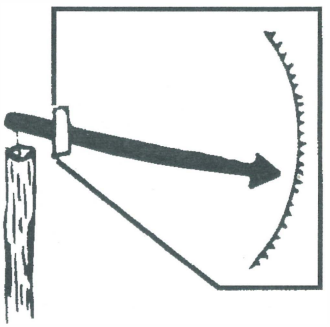
The stronger the wind, the faster the fire spreads. This is because the wind brings in fresh supplies of oxygen to feed the flames. It moves ahead of the eager flames, heating up the fuel in its path to provide more tinder. The air above the fire becomes heated and rises. As it rises, cooler air rushes in to take its place and this movement propels the fire to greater speed.

Generally, the least wind is in the early morning between 4 a.m. and 7 a.m.

In the evening and during the night, the air at higher levels on hills becomes cooler, and the warm currents coming up the slope reverse their direction and flow back down the slopes. Normally, **Wind flows up hillsides and canyons by day and down by night.**

Relative Humidity

Relative humidity is the amount of moisture in the air at a given temperature compared to the amount of moisture the atmosphere is able to hold at that temperature. As the humidity in the air diminishes, so does the moisture in wood (fuel). The amount of moisture in the fuel is controlled by the relative humidity in the air and is termed "fuel moisture". Wet fuel will not burn easily. Foresters use fuel moisture indicator-sticks to find the moisture content in wood to establish fire potential. The sticks are weighed and measured daily at regular intervals to learn how much moisture is being absorbed into the atmosphere from the sticks and how rapidly this occurs. As well as measuring the amount of moisture in the fuel, foresters must also know the amount of moisture in the air so that they can establish a forest fire danger rating.



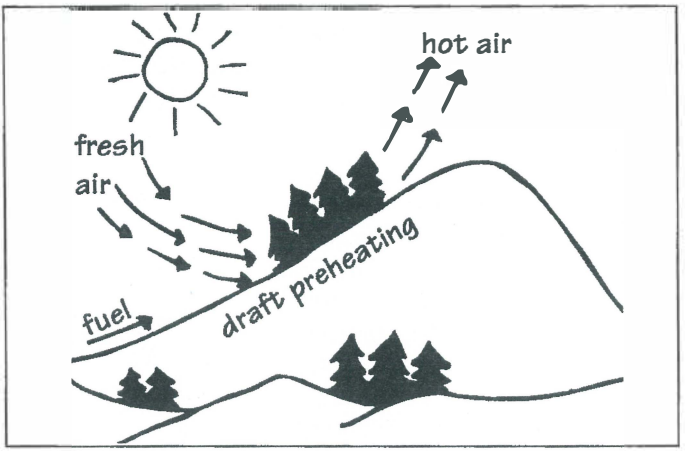
Fuel Moisture Scale and Indicator Sticks

To test for the relative humidity in the atmosphere, a small instrument known as a sling psychrometer is used. This simple instrument is merely two thermometers attached to a frame. At the base of one thermometer is fastened a piece of wet cloth. Using a handle attached to the top of the frame, the instrument is twirled through the air for one full minute–keeping the instrument shaded from the sun. A reading is taken of both thermometers (known as the wet bulb and the dry bulb) and the two figures are computed from a chart of temperatures to determine the relative humidity in the atmosphere. Relative humidity below a rating of 30 warns that a fire hazard exists.

Topography

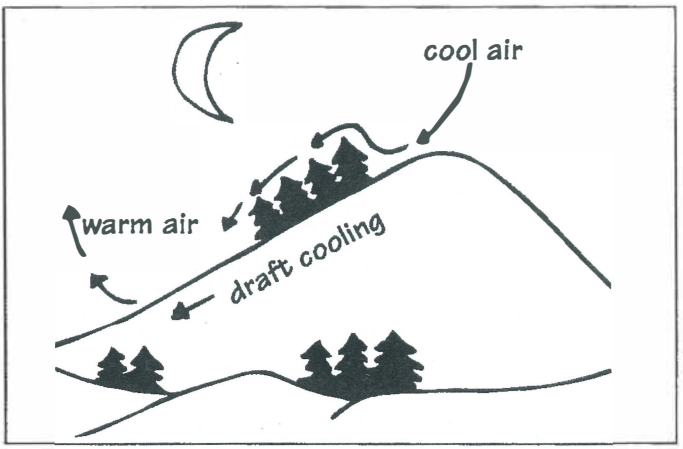
Slope of the land has a big effect on the spread of a fire. **Slope** affects the spread of fire in two ways.

1. **Preheating:** Fuels preheated by the sun burn more quickly than cold fuels. The temperature of the ground also affects the movement of the air currents.
2. **Draft:** A fire will run faster uphill than downhill unless the wind is strong enough to reverse it. On the uphill side, the flames are closer to the fuel which causes preheating and faster ignition.



As the hot air rises, cool air replaces it and causes a draft that increases the spread and speed.

The flow is reversed at night. As the day's hot air rises, the cool night air is in the higher altitudes, and sweeps down the slopes to replace the rising hot air.



Weather Watching

Have you ever watched a cloud? Or wondered if it will rain? Or snow? Or decided to leave your raincoat at home because the sun was shining early in the morning, and later got soaking wet in a surprise thunderstorm? Learning to observe weather signs and to predict the weather can help you to choose what clothes to wear outdoors or to decide what equipment to bring on dayhikes.

This Weather Watching Activity has four projects for you to do.

Weather Clue Chart

Clouds, wind and temperature can give you important clues to help you predict the weather. Use the clue chart to predict what weather is coming your way.

Beaufort Wind Scale

How strong is the wind? To use this scale, look carefully at what the wind is doing. Then, compare it to the descriptions on the chart. Find the Beaufort number and the general description for your observations.

Make Your Own Cloud Chart

Colour in your own cloud chart. Then, use your chart with the Weather Clue Chart to help predict the weather.

Weather Forecast

Predict the weather...then compare it to the actual weather.

Weather Clue Chart

LOOK FOR:	WHEN:				
	Clouds	Temperature	Winds	Air Pressure	Humidity
Weather to stay Fair	Move higher and decrease in numbers when morning fog disappears..	Average for the season.	West to northwest and gentle.	Remains steady or goes up slowly.	Stays low.
Weather to get Worse	Become thicker, lower and darker to the west.	Above or below average for the season.	Shifts to between east and south.	Falls steadily or rapidly.	Goes up.
Rain or Snow	Change from cirrus to lower types of rain or snow clouds.	Goes up.	Increases in speed, usually from the east.	Falls. The faster the air pressure falls, the sooner rain or snow.	Goes up.
Thunder-storm	Change from cumulus to cumulonimbus.		Increases in speed rapidly.	Falls	
Weather to Clear	Rise and break up.	Rises after warm front. Drops after cold front.	Swings from east through south to west.	Rises	Goes down
Colder Weather		Goes down	From north or north-west.	Rises	
Warmer Weather		Goes up	From the south.	Falls	

Beaufort Scale or Wind Force*

Beaufort Number	General Description	Observations for Estimating Wind Speeds	Wind Speed in km/h at 10 m above ground
0	Calm	Smoke rises vertically	Less than 1
1	Light Air	Smoke, but not wind vanes, shows direction of wind.	1-5
2	Light Breeze	Wind felt on face; leaves rustle; wind vanes moved.	6-11
3	Gentle Breeze	Leaves and small twigs moving constantly; small flags extended	12-19
4	Moderate Breeze	Dust and loose paper raised; small branches moved.	20-28
5	Fresh Breeze	Small leafy trees swayed	29-38
6	Strong Breeze	Large branches in motion; whistling heard in telegraph wires	39-49
7	Moderate Gale	Whole trees in motion.	50-61
8	Fresh Gale	Breaks twigs off trees.	62-74
9	Strong Gale	Slight structural damage occurs	75-88
10	Whole Gale	Trees uprooted; considerable structural damage	89-102
11	Storm	Very rare; widespread damage	103-117
12	Hurricane	Very rare	118 and over

**Developed in 1805 by Irish hydrographer Sir Francis Beaufort.*

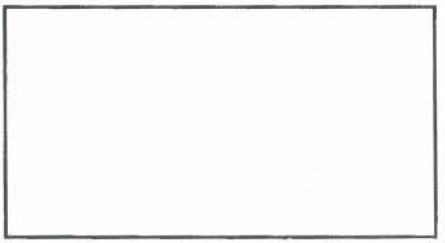
Make your own Cloud Chart

Cirrus Clouds

These are the highest of clouds. They are 25,000 ft. and higher and are made entirely of ice crystals. They appear thin, wispy or feathery, and indicate an approaching storm.

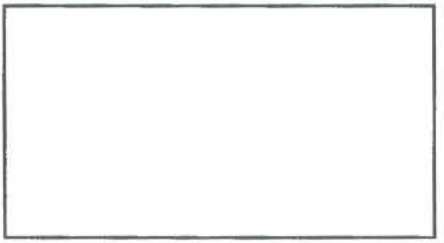
Cumulus Clouds

Heaped up or piled up, these are white fluffy clouds, flat at the bottom, but rounded at the top. They usually form during the day, and disappear at night. They are often referred to as "fair-weather" clouds.



Stratus Clouds

These are spread-out clouds appearing as a low sheet with layers. They give the sky a hazy or milky appearance. When they are dull gray, they may even produce a drizzle or slow-moving rain.

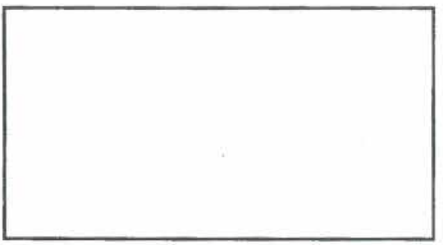


Nimbostratus Clouds

These are low-layered dark gray rain clouds. They move slowly and usually remain in the sky over long periods. They usually produce a slow, driving rain.

Cumulonimbus Clouds

These clouds are tall mountainous clouds that can measure four or more miles from top to bottom. Dark gray in colour, they are a source of violent storms, such as thunderstorms. They are often referred to as "thunderheads".



Weather Forecast

Date			
Time			
Temperature			
Barometer Reading			
Wind Direction			
Wind Speed			
Number of Clouds			
Kinds of Clouds			
Precipitation (rain/snow)			
Present Weather			
Your Forecast			
Actual Weather			

- Make your observations at the same time every day.
- Keep a complete record of your observations.
- Note what you observe, not what you expect to observe.

Wildlife Watching

Wildlife Terms

Herbivore: An animal that eats plants, nuts and seeds.
Carnivore: An animal that eats meat.
Omnivore: An animal that eats plants and meat.
Browse: Plant shrubs (low bush)
Scats: Animal droppings (feces).

Learn To Stalk Animals

- Keen observation is important.
- Look for signs and watch for sudden movements.
- Walk slowly and silently.
- Lift feet high so you don't rustle the grass or kick any stones.
- When walking on grass or leaves, the heel of your foot should come down first, then the toe slowly.
- On rocky ground, the toe comes down first.
- Never approach down-wind. An animal can hear and smell better with the wind coming towards him.
- In the woods, walk upright.
- In low bushes–crouch.
- In deep grass–crawl.
- Try and blend in with the background.
- Watch for your shadow it may give you away.
- Watch your quarry constantly. At the slightest sign of alarm–freeze!

To practice stalking, play this game. Choose a friend to be a deer. The deer pretends to be eating grass. Everyone else tries to sneak up to the deer as close as possible before being caught.

Make a wildlife watchers book. Make photocopies of the Wildlife Watchers pages, cut the pages in half, make a front and back cover and staple the pages together. Or use the pages provided in your manual. Ask your leader to look into the Watchable Wildlife Program available from Alberta Fish and Wildlife.

SIGNS: **TRACKS:**

SCATS: **BEHAVIOUR:**

NAME OF ANIMAL _____

SIZE: **SIGHT:** **HABITAT:**

BREEDING:

How often are babies born?
How many?
What are they called?
Do the parents mate for life?

How are the young looked after?

COLOUR & MARKS:

Fur (long/short?)

Tail:

FOOD:

What kind:
summer?
winter?
How often do they eat?

HOME:

Hibernation: Where? How long?

SIGNS: **TRACKS:**

SCATS: **BEHAVIOUR:**

NAME OF ANIMAL _____

SIZE: **SIGHT:** **HABITAT:**

BREEDING:

How often are babies born?
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summer?
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Are the parents mates for life?

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COLOUR & MARKS:

Fur (long/short?)

Tail:

FOOD:

What kind:
summer?
winter?
How often do they eat?

HOME:

Hibernation: Where? How long?

Notes

Leadership

Junior Forest Warden club councils, leaders and wardens work together to organize their club program. In the Trailblazer Green Tree Leadership program you will:

- Help to plan club activities
- Work in small groups to organize a project
- Lead small groups of wardens
- Participate in community service projects
- Become responsible for yourself, to others, your Junior Forest Warden Club and the environment.

The ideas and information in this chapter will help you to become part of organizing your club's activities. The Green Tree warden record cards at the back of this manual list some of the activities you can do to develop your leadership skills and help you to plan club activities.

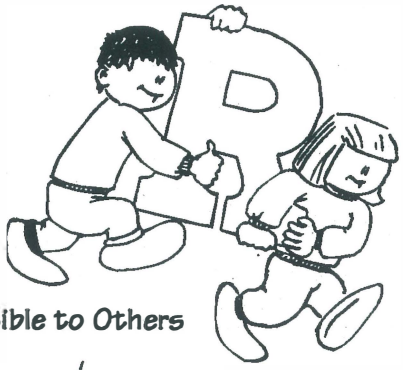
The 3rs

Junior Forest Wardens have 3 responsibilities.
Junior Forest Wardens are:

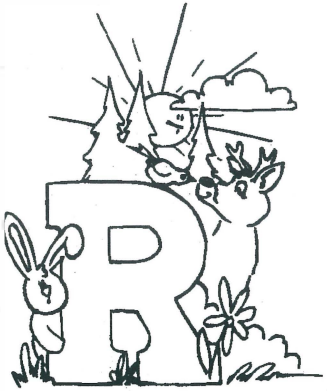
- Responsible for **Themselves**
- Responsible to **Others**
- Responsible to their **Junior Forest Warden Club** and the **Environment**

Whenever you are deciding what to do or say, think of the 3 Rs. You can use the 3 Rs to decide how to behave or to find a solution to a problem.

Responsible for Yourself



Responsible to Others



Responsible to Junior Forest Wardens and the Environment

Problem Solving

A problem? or a challenge? Every day people have many problems to solve. Some problems you might have to face are: Should I take my raincoat on a dayhike? What should I take with me on a hike?

Here's one method that may help you to solve a problem:

1. First, you need to notice that there is a problem.
2. Gather all the facts and feelings from everyone involved about the problem.
3. Brainstorm different "ways" to solve the problem.
4. Evaluate the "ways".
5. Choose a "way" that will work for you and the people involved.

6. Try it!
7. Later, discuss how well your solution is working.

Practice solving problems by yourself and with your club. Together you and your JFW friends can creatively solve any problem.

Planning a Club Event

Use this worksheet to plan a club event.

Plan It!

1. What do we want to do? _____

_____

2. Why are we doing this activity? _____

_____

3. When will we do it? _____

_____

An alternative date: _____

4. Where will we do it? _____

_____

_____

5. Our plan to get it done

What Needs To Be Done:	By Who?	By When?
e.g., Plan the lunch menu	Darcy	October 1

6. What things do we need to think about when we are planning this activity? Set your limits now (e.g., time, location, weather, skills or leadership needed, number of people attending, what materials we need? cost).

7. What supplies do we need?

8. What transportation do we need? Who will arrange it?

9. What preparation do we need to do?

What Needs To Be Done:	By Who?	By When?
e.g., Buy the food	Linda	Tues. at 4 p.m.

Our Celebration Plan

Use this worksheet to plan a club celebration.

What are we celebrating?

_____

When is the celebration?

Day _____ Time _____ Date _____

Who will come to the celebration?

_____

Where will it take place?

_____

Our celebration plan:

	What	Who's Responsible
Arrival at the location:		
The Opening:		
The Celebration:		
The Closing:		
The Departure:		

Things we will need:

What?	Who?	Done?

Our Budget

What we have to spend: _____

What we actually spent: _____

The Difference: (Where does it come from? or where will it go?)

_____

Notes:

Dayhike Plan

Discuss the questions on this worksheet when you are planning a dayhike.

1. Why are we going? (What are the purpose, goals, objectives and expectations?)
2. What activity will we be doing? (Are they relevant to the JFW program?)
3. Where are we going?
4. How are we getting there?
5. What date and time are we meeting?

   When are we leaving?

   How long is the drive to the hike trailhead?

   How long is the hike?_____hours?

   _____What time are we returning?

5. Our Dayhike Activity Plan

Time	**Activity**	**Who is the leader?**

6. What equipment do we need to bring?

   Personal Equipment: _____

   Club Gear: _____

7. What are our first aid and safety plans? What will we do if someone gets injured or lost?

_____

_____

8. What food will we eat? How will it be organized?

_____

_____

_____

_____

9. Our Action Plan for preparing for the dayhike.

What needs to be done	By Whom	When
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

10. Make two copies of this plan. Leave one copy with a JFW Club member who is staying at home. Take one copy with you. Make sure you tell the JFW Club member when you return.

Leadership Notes

Here is a space for your notes on program planning, dayhike planning, and other leadership tasks that you will do as a Junior Forest Warden.

Notes

Your Record Cards

Use these record cards to keep track of activities you have completed. If your club follows the Tree Challenge Badge Program ask your leader to initial and date your completed activities.

Forestry

Forest Protection

Identify and make a poster showing the life cycle of four insects. _____

Demonstrate the clip and burn method of control. _____

Present a sample collection or display of forest diseases that are common to your community. _____

Describe the role weather plays in forest fires. _____

Tour a fire tower or a fire guard site. _____

Timber Management

Describe how timber products are used in your community. _____

Describe ways to improve tree growth. _____

Demonstrate two ways to estimate the age of a tree. _____

Grow a seedling from a seed. _____

Plant 20 trees. _____

Describe two different harvesting methods. _____

Participate in the harvesting and use of two different kinds of trees. _____

Forest Uses

Participate in a land use planning game. _____

Describe how the forest is important to you. _____

Range and Ranching

Make a poster or creative project that shows how rangelands are used. _____

Watershed Management

Demonstrate ways in which water can be conserved on club campouts. _____

Wildlife Management

Describe the importance of fish and wildlife to you. _____

Identify commercially important fish and wildlife resources in your community. _____

Participate in a club wildlife habitat improvement project. _____

Community Service

Participate in a litter clean-up activity. _____

Plan and carry out your own conservation project. _____

Participate in a community service project. _____

Notes:

_____

_____

Congratulations

This will certify that _____

of the _____

Junior Forest Warden Club
has completed all of the requirements of the
Green Tree Forestry Badge

Junior Forest Warden Leader Signature : _____

Date: _____

Woodstravel

First Aid

Complete a St. John's Ambulance or Red Cross first aid course _____

Demonstrate rescue breathing _____

Make and use a first aid kit _____

Fires

Build a cooking fire and cook a meal on it during two different seasons. _____

Put out a fire properly. _____

Build a flint and steel fire. _____

Build a no-trace fire. _____

Clothing

Present a display, skit or other presentation on outdoor clothing. _____

Demonstrate how to get warm or cool off through the proper use of clothing. _____

Shelters

Build two types of natural shelters.

Shelter 1: _____

Shelter 2: _____

Demonstrate how to locate sites for shelters. _____

Describe when to use different types of shelters. _____

Map and Compass

Show the proper use of a compass, including declination. _____

Identify natural features from a topographical map. _____

Use map and compass skills to select a route. _____

Compete in orienteering activities or a competition. _____

Heat and Cold Injuries

Describe how to avoid hypothermia and frostbite. _____

Explain why dehydration is a problem. _____

Demonstrate how to give first aid to a person with hypothermia. _____

Dayhike Foods

Plan a 3 day trail menu for a backpacking or ski touring trip. Include the preparation, cost and energy level of the food chosen. _____

On a cookout, demonstrate proper hygiene techniques for food preparation and waste disposal. _____

Knots and Lashings

Demonstrate and name the use of six knots. _____

Demonstrate and name the use of 2 lashings. _____

Show the proper use of 4 knots of your choice in an emergency situation. _____

Survival

Show how to make and follow an emergency plan. _____

Search and Rescue

Describe what you would do if one of your JFW club friends gets lost on a dayhike. _____

Describe 6 things you would do if you were lost. _____

Lead a search for a lost article. _____

Hikes and Campouts

Participate in 9 dayhikes. Record the dayhike date and year.

1. _____ 2. _____

3. _____ 4. _____

5. _____ 6. _____

7. _____ 8. _____

9. _____

Participate in 6 campouts. Record the campout date and year.

1. _____ 2. _____
3. _____ 4. _____
5. _____ 6. _____

Show you know how to do the basics in 3 of the following:

Hiking _____ Snowshoeing _____
Canoeing _____ Cross-country Skiing _____

Notes

_____

_____

_____

_____

_____

_____

Congratulations

This will certify that _____

of the _____

Junior Forest Warden Club
has completed all of the requirements of the
Green Tree Woodstravel Badge

Junior Forest Warden Leader Signature : _____

Date: _____

Ecology

Enjoying the Outdoors

Make five crafts from natural materials found in the forest.

Craft 1. _____

Craft 2. _____

Craft 3. _____

Craft 4. _____

Craft 5. _____

Make a project (e.g., poster, display) that shows what you most enjoy about forests and natural areas. _____

Plants, Animals and Homes

Identify three plants that grow in forests that you can eat. _____

Describe what a habitat is. _____

Describe several effects of fire on the environment. _____

Identify some endangered species in your province and describe what you can do to help them. _____

Identify four types of clouds and describe what they indicate about the weather. _____

Construct simple weather instruments and use them to predict weather on club campouts. _____

Notes

Congratulations

This will certify that _____

of the _____

Junior Forest Warden Club
has completed all of the requirements of the
Green Tree Ecology Badge

Junior Forest Warden Leader Signature : _____

Date: _____

Leadership

Planning

Work on a planning committee to plan a one year program for your group _____

Assist with the preparation of five club activities or projects.

1. _____
2. _____
3. _____
4. _____
5. _____

Participate in evaluating five club activities or projects.

1. _____
2. _____
3. _____
4. _____
5. _____

Responsibility

Use the 3Rs to decide how to solve a problem. _____

Think of three things you could do to help your JFW club. Suggest them to your leader, get approval, do them, and discuss the results with your club.

1. _____
2. _____
3. _____

Plan, complete and report on one, at-home or at-club project. _____

Display projects you have done at the club or in the community. _____

Cooperation

Work in a small group to plan and complete five projects.

1. _____

2. _____
3. _____
4. _____
5. _____

Leading Others

Coordinate part of a club program or event. _____

Leading a group of two to four wardens, plan and complete a project. _____

Community Service

Participate in two community service projects.

1. _____
2. _____

Plan and lead part of a group or club project.

_____

Congratulations

This will certify that _____

of the _____

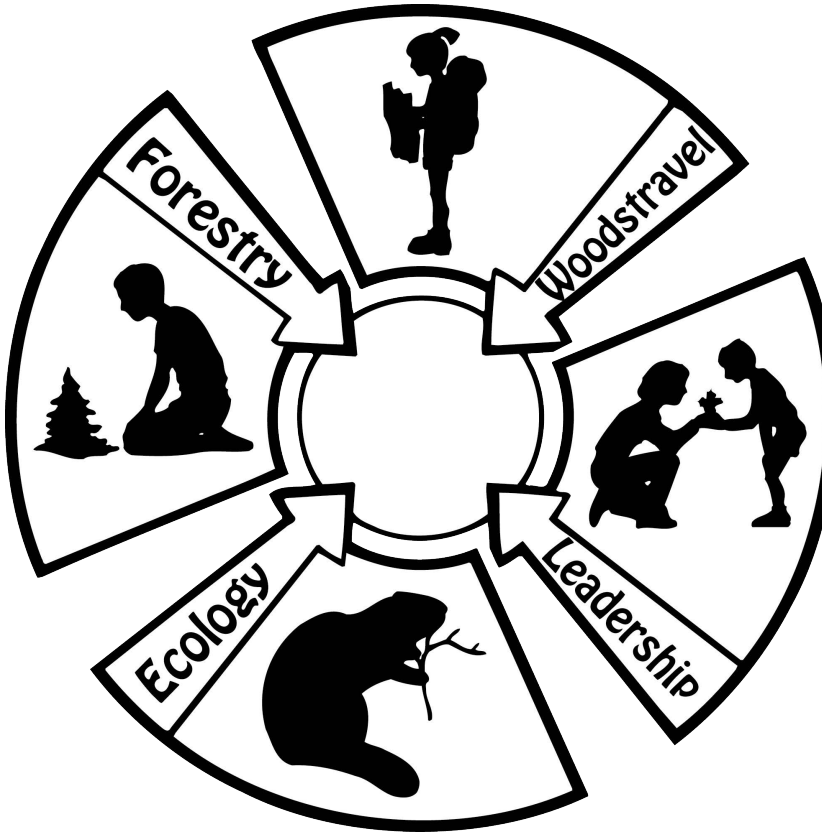
Junior Forest Warden Club
has completed all of the requirements of the
Green Tree Leadership Badge

Junior Forest Warden Leader Signature : _____

Date: _____

Laugh from the toes up • Give handmade birthday cards • Shovel someone's sidewalk • Lay in a field and watch the clouds • Feed the birds • Seek the wisdom of older people • Howl, even when the moon isn't full • Focus on people's good points • Phone a friend • Never stop learning • Be known as someone who gets things done • Make someone happy • Listen to the quiet • Be proud of your accomplishments • Never refuse homemade chocolate chip cookies • Make the most of the weather • Exercise your mind and your body • Get involved—volunteer • Start your day with a smile • Give a dandelion bouquet • Return borrowed books • Laugh at yourself • Watch a sunrise, share a sunset • Remember other people's birthdays • Be the first to say "Hello" • Believe in yourself • Always say "Thank you" • Admit your mistakes • Surround yourself with positive people • Be patient • Look for shooting stars • Be your own best friend • Plant a tree • Listen to the birds • Leave things a little better than you found them • Be forgiving of yourself and others • Make new friends and cherish old ones • Hug a tree • Give your enthusiasm to everyone • Say "hi" to the new kid in your class • Laugh out loud • Eat an ice cream cone from the bottom

* Adapted with permission from Alberta Career Development, Positive Works poster. 1992.


Forestry
Woodstravel
Ecology
Leadership

- **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn - **Our Code** - We have been given the earth for our life. It is a great entail. It belongs as much to those who come after us as to us, and we have no right by anything we do, or neglect to do, to involve them in unnecessary penalties or to deprive them of benefits which are theirs by right. - **Our Motto** - Keep our Forests Green - **Our Pledge** - As one who believes in the aims of the Junior Forest Wardens, I pledge myself and my services to the appreciation and responsible use of our forests, wildlife, and natural heritage. - **Our Watchword** - Watch and Warn **- Our Code -** We have been given the earth for our life. It is a great entail. 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